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The first-ever comprehensive research in India ranks the country's OTT platforms on their functional experience and emotional quotient

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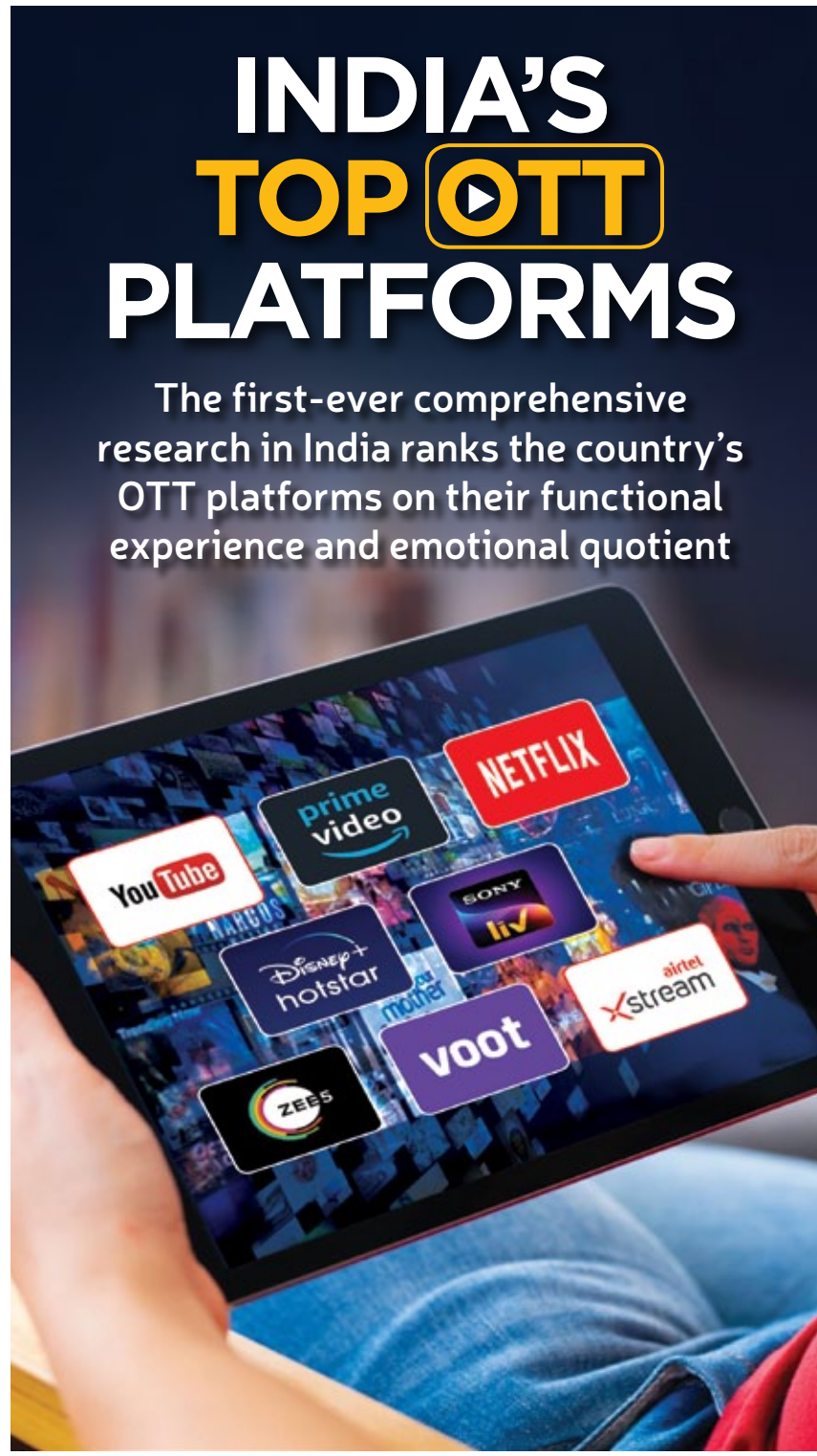

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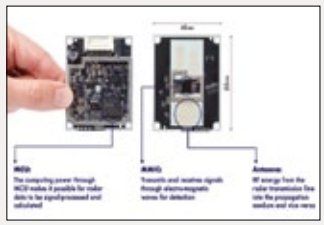

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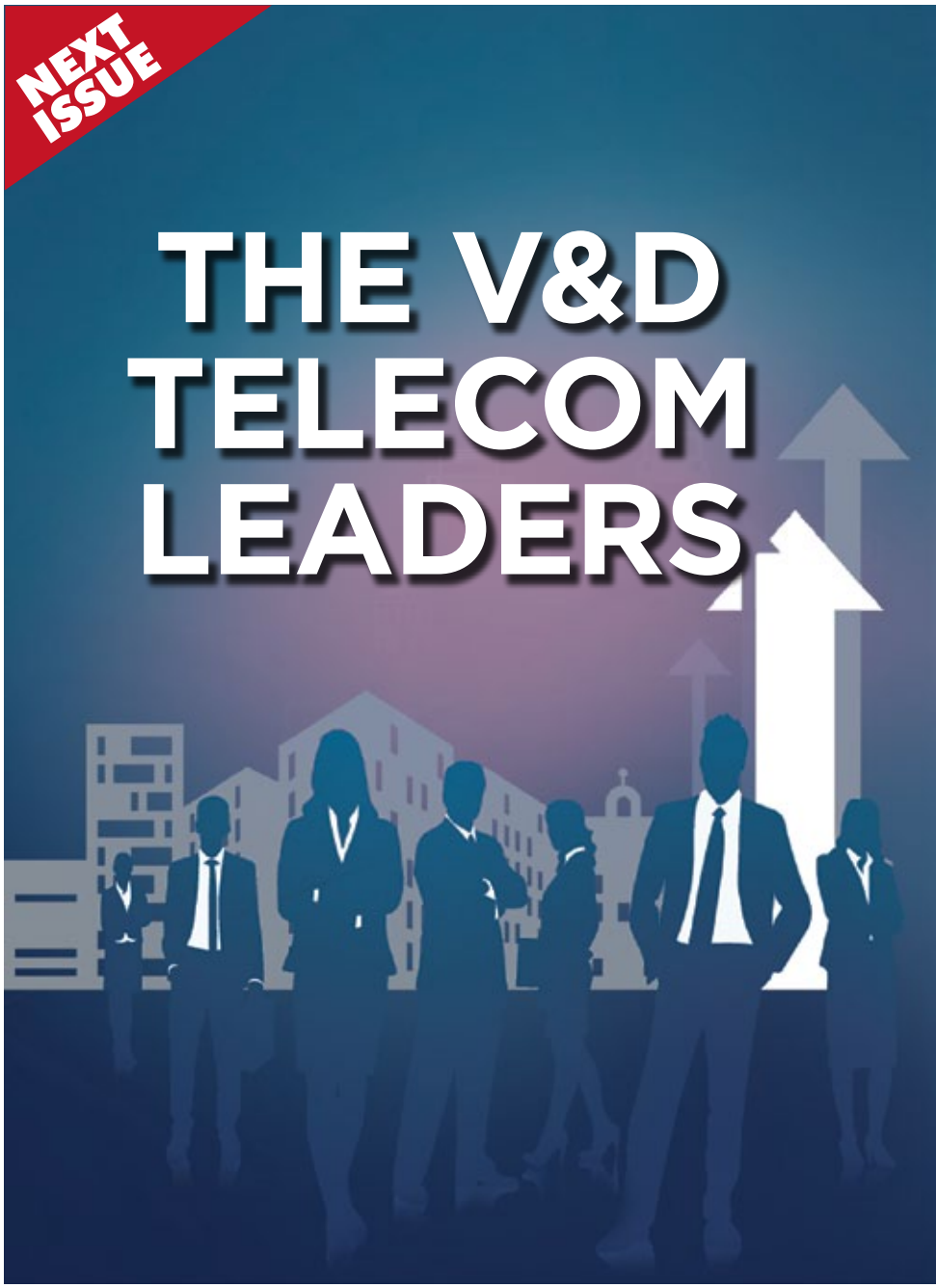

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SHUBHENDU
PARTH

[OPENING NOTE]

Media and entertainment goes over the top

Over-the-top (OTT) is the new love in India – both for the subscribers and players in the digital media and entertainment (M&E) space. It is also an area of key interest for the telcos that are now using OTT subscriptions to fight a new war. With the price-war bleeding the telcos, who now agree that a minimum floor price is essential for the healthy growth of the sector, the carriers are now doling free OTT subscriptions to ramp up their market share.

This is understandable; a Nasscom Community Insight report points out that the proliferation of smartphones and the availability of low-cost internet connectivity, coupled with the extended lockdowns during 2020, OTT has emerged as the next normal in the world of entertainment. According to a report by PricewaterhouseCoopers (PwC), India is currently the world's fastest-growing OTT market, and is all set to emerge as the world's sixth-largest by 2024.

The PwC report estimates that the OTT market in India will grow at a CAGR of 28.6% over the next four years to touch revenues of UD 2.9 billion. It also indicates that the country's total digital M&E revenue may register a 10.1% growth rate to reach USD 55 billion by 2024. The Media and Entertainment Outlook 2020 report points out that OTT video, along with online advertising, video games and e-sports, and music, radio and podcasts are the top four segments expected to see revenue growth in the country over the next four years.

The story of the OTT is similar in other parts of the world, especially in the Asia-Pacific region; the pay-TV service bearing the maximum brunt of the new players in the M&E sector. An analysis by GlobalData indicates that pay-TV subscriptions in Hong Kong, Singapore, Australia, and Vietnam will witness a slowdown as users swap their traditional pay-TV subscriptions with OTT video alternatives. It expects the pay-TV service revenue in Asia-Pacific to drop from USD 61.6 billion in 2020 to USD 60.8 billion in 2025; indicating a negative growth in the sector. In India, the pay-TV services revenue is expected to crawl at a CAGR of just 0.7%, up from USD 3.19 billion in 2020 to USD 3.30 billion in 2025.

To understand and evaluate the performance of OTT platforms in the country and rank the best, Voice&Data commissioned India's first-ever comprehensive research to CMR and Mozark. The effort led to the country's first report on the performance of OTT players based on the functional experience and emotional quotient. While the functional experience includes the responsiveness and streaming index, the emotional quotient maps the attachment that a user has to a particular platform.

The overall outcome is ranking of the Top OTT Platforms in India. Going ahead, we hope to include the regional-language OTT players in the ranking as well.

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INDIA'S TOP OTT PLATFORMS

The first-ever comprehensive research in India by **Voice&Data-Mozark-CMR** ranks the country's OTT platforms on their functional experience and emotional quotient

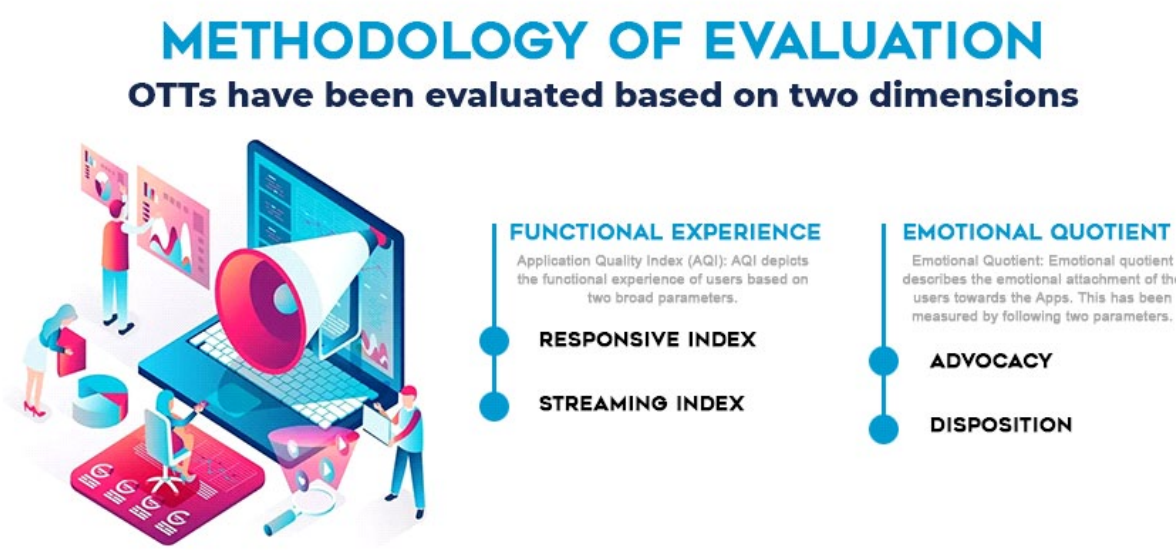
An over-the-top (OTT) media service is a streaming media service offered on to viewers via the net. The OTT bypasses cable, broadcast, and satellite television platforms, the businesses that historically act as a controller or distributor of such content. OTT platforms were widely popular in 2020 as it promised to entertain the customers when they needed it during lockdown, which had restrained the people movement and most of the other entertainment channels were facing the hardship due to lockdown. These time most of the apps plunged into the wagon but some gained more and some a little less.

Riding on top of the massive surge in demand during the lockdown and growing mobile internet connectivity, India has emerged as the world' fastest growing OTT market; it is expected to grow at nearly 30% CAGR over next five years. In terms of revenue it is likely to exceed USD 3 billion during the period.

No-doubt the content in OTT is the biggest driver for attracting customers. At the same time user experience is equally important. User experience ensures the loyalty of the customers towards a particular platform so that they can come again and again to the same platform for viewing their favourite show, movies and other content.

With the rise in OTT popularity, there are many who believe that digital TV may replace satellite TV completely. In order for that to happen, user experience on OTT platforms will need to match that of the satellite TV. Users will need seamless streaming experience and the OTT players will need to be more responsive. Besides, all these features will need to translate into customer satisfaction, which will lead to high recommendation (advocacy) and disposition.

To check how each of the apps was performing on the rich user experience front, Voice&Data commissioned India's first study to CMR and Mozark to conduct a comprehensive test to evaluate the performance of OTT Apps in the country using the Synthetic Experience Monitoring (SEM) solution. To get a clear understanding CMR and Mozark also conducted a primary survey to capture customers feedback for Airtel Xtreme, Disney+Hotstar, Netflix, Amazon Prime Video, SonyLIV, Voot, YouTube, and Zee5.


METHODOLOGY OF EVALUATION
OTTs have been evaluated based on two dimensions
FUNCTIONAL EXPERIENCE
Application Quality Index (AQI): AQI depicts the functional experience of users based on two broad parameters.
RESPONSIVE INDEX
STREAMING INDEX
EMOTIONAL QUOTIENT
Emotional Quotient: Emotional quotient describes the emotional attachment of the users towards the Apps. This has been measured by following two parameters.
ADVOCACY
DISPOSITION

RESPONSIVE INDEX	STREAMING INDEX
App start load time	Play start time
Home page load time	Rebuffering rate
Search response time	# of buffer instances per minute
Time to load page from carousal	

Time to load page from carousal

The joint study used Mozark's industry-first SEM solution that uses completely non-intrusive methods to measure the user experience. Tests were performed on low-end and high-end smartphones connected to real telco networks (Airtel, Jio, and Vodafone-Idea). The company's machine learning (ML)-driven platform analyzes automation, OS, and network logs, along with video stream analysis to derive these KPIs. The solution helps test how the apps are performing in real user conditions and how they are perceived by the customers.

The values on each of the above parameters were converted into a four-point scale. The application quality index (AQI) was derived by aggregating the average scores of responsive index and streaming index. Overall, three major data logs are analyzed to build the AQI.

- Automation logs that provide an understanding of on-field app experience
- Device logs, which provide details on on-device resource performance
- Network logs that provide app to backend diagnostics

Emotional Quotient: Emotional quotient describes the emotional attachment of the users towards the apps. This was measured using the following two parameters.

Advocacy: This depicts the willingness of users to recommend the brands to peers. This was measured in 10 point scale in which 10 represents 'highly recommend' and one (1) represents 'not at all recommend'.

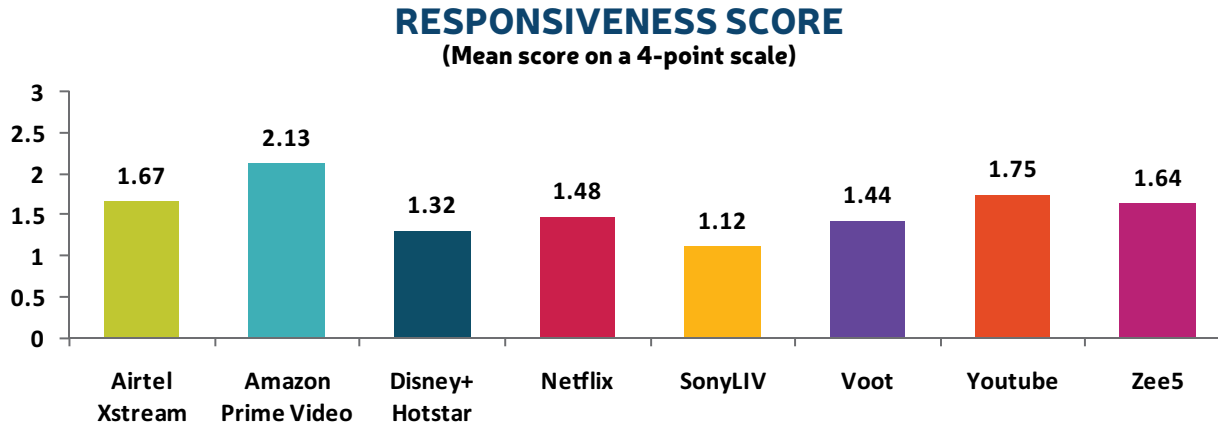
Disposition: This depicts the disposition of users towards brands. This was measured on a seven-point scale in which seven (7) represents highest disposition and one (1) represents lowest disposition as described in different terms – insist, prefer, intend, accept, no opinion, unaware, and reject.

Performance of OTT apps on AQI

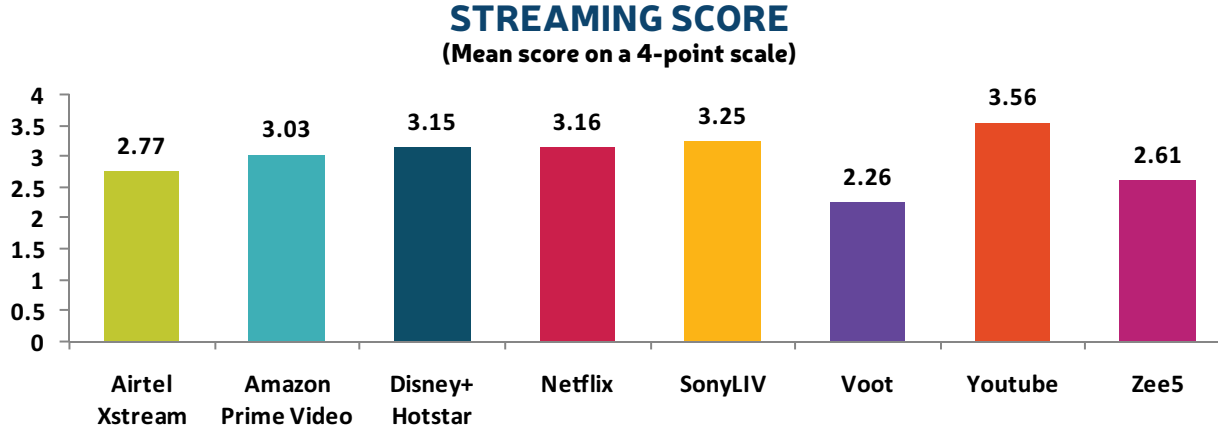
Responsive experience: Amazon Prime Video is the most responsive app followed by YouTube, Airtel Xstream and Zee5. Responsiveness score of Amazon Prime Video is 22% higher than second most responsive app, YouTube. However, the responsiveness of apps in India fall short of global average scores which are closer to 3.

Streaming experience: In the streaming index, YouTube ranks highest followed by SonyLIV, Netflix and

In the streaming index, YouTube ranks highest followed by SonyLIV, Netflix and Disney+Hotstar. YouTube scored 10% higher than next best streaming app SonyLiv.



Source: Voice&Data-Mozark-CMR report, India's Top OTT Platforms 2020



Source: Voice&Data-Mozark-CMR report, India's Top OTT Platforms 202

> Amazon Prime Video is the most responsive app followed by YouTube, Airtel Xstream and Zee5. It scored 22% higher than the second most responsive app, YouTube.

Disney+Hotstar. Score of YouTube is 10% higher than that of next best streaming app SonyLiv. The study reveals that global players dominate streaming performance over local players.

AQI score: Benchmarking OTT's AQI

While combining responsive index and streaming index, YouTube scores highest closely followed by Amazon Prime Video. The research indicates that AQI of YouTube is 13% higher than Netflix, which came third, over the past one year.

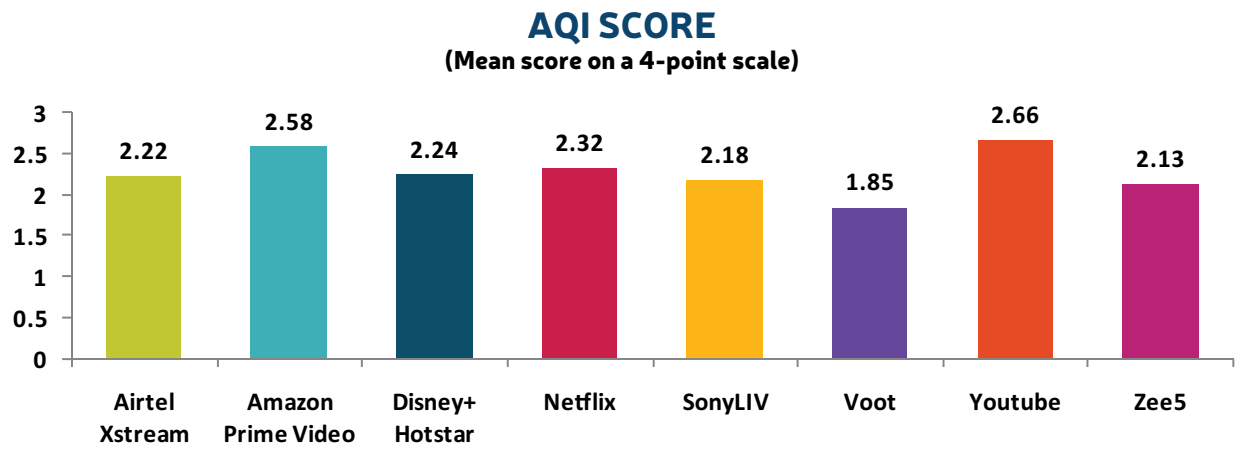
It was also observed that global apps performed better than their local peers like Voot and Zee5, perhaps because of their ownership of the content delivery infrastructure that allows them to depend less on third party integrations and manage existing integrations more efficiently.

Performance of OTT apps on emotional quotient

Advocacy index: YouTube has highest recommendation score closely followed by Amazon Prime Video. Recommendation scores of Netflix and Disney+Hotstar are almost same, bringing them both at the third rank. The study reveals that even on this parameter, global apps perform better than their local peers.

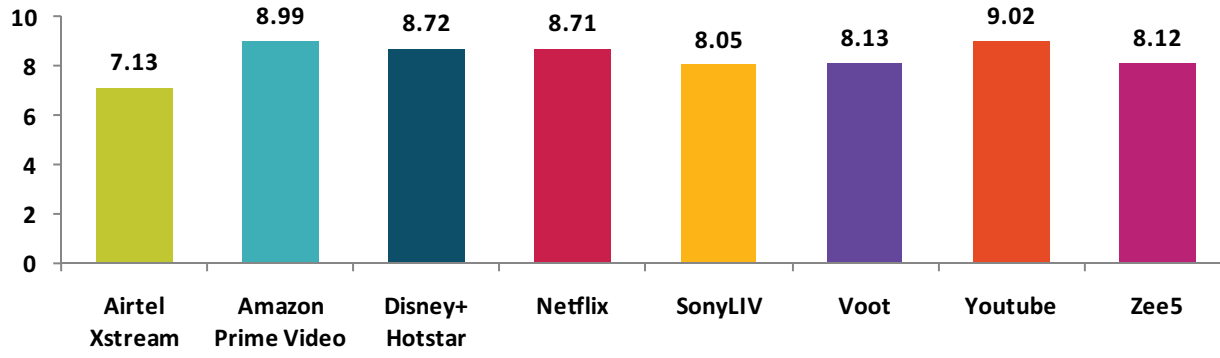
Amazon Prime Video has highest disposition score followed by Netflix. YouTube and Disney+Hotstar are ranked at third and fourth position respectively.

Emotional quotient has been derived by converting recommendation score and disposition score into one scale. This was done by assigning maximum value of each parameter into 100 and changing the rest of the value accordingly. Emotional quotient is the average of



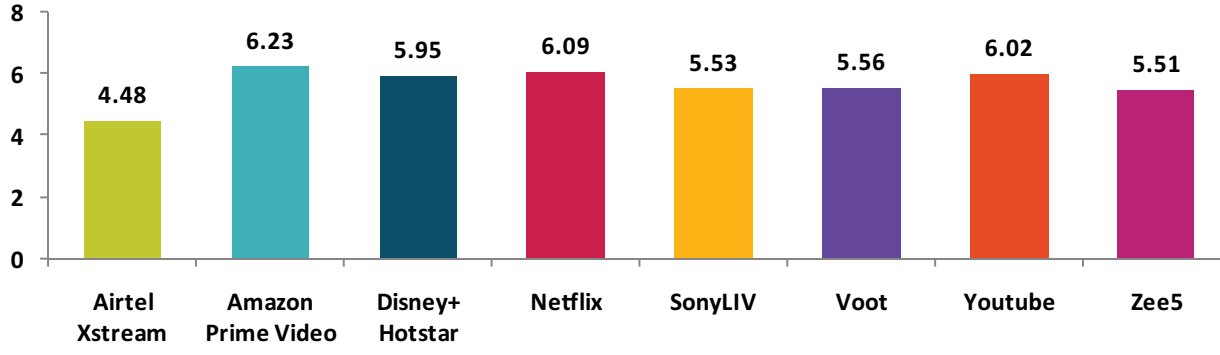
Source: Voice&Data-Mozark-CMR report, India's Top OTT Platforms 2020

RECOMMENDATION SCORE
(Mean score on a 10-point scale)



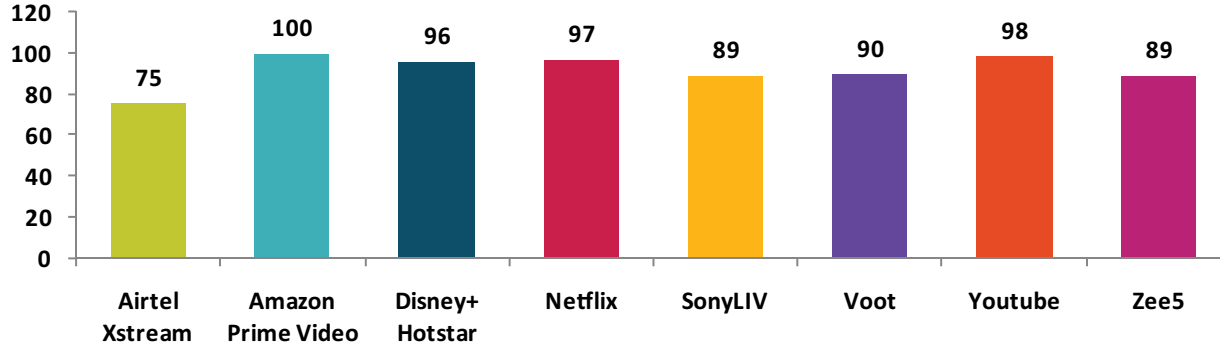
Source: Voice&Data-Mozark-CMR report, India's Top OTT Platforms 2020

DISPOSITION SCORE
(Mean score on a 7-point scale)



Source: Voice&Data-Mozark-CMR report, India's Top OTT Platforms 2020

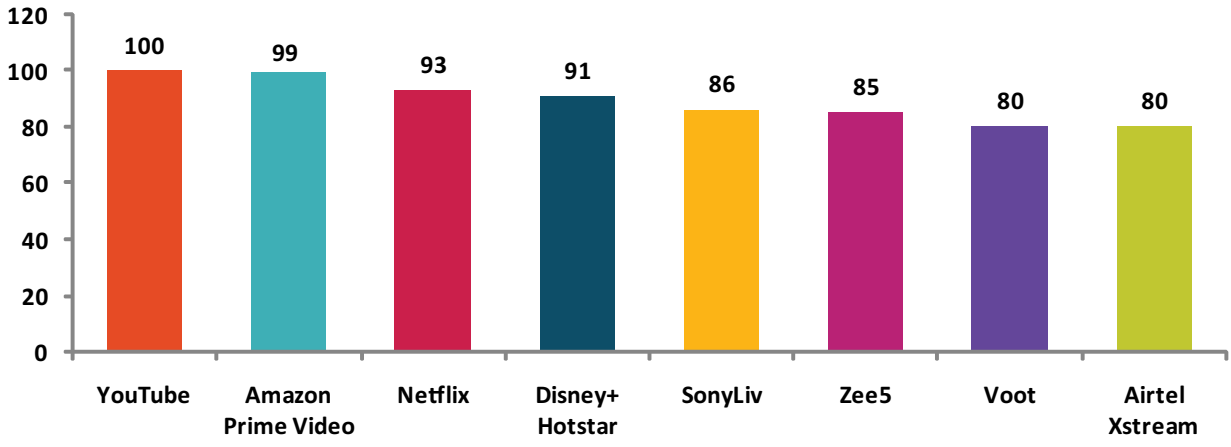
EMOTIONAL QUOTIENT
(Depicting maximum score as 100)



Source: Voice&Data-Mozark-CMR report, India's Top OTT Platforms 202

EMOTIONAL AND FUNCTIONAL EXPERIENCE INDEX

(Depicting maximum score as 100)



Source: Voice&Data-Mozark-CMR report, India's Top OTT Platforms 202

INDIA'S TOP OTT PLATFORMS (2020)

YouTube	1
Amazon Prime Video	2
Netflix	3
Disney+ Hotstar	4
SonyLiv	5
Zee5	6
Voot	7
Airtel Xstream	8

that converted values of both the parameters. Amazon Prime Video has the highest emotional quotient closely followed by YouTube.

Emotional and Functional Experience Index (EFEI) has been derived by converting emotional quotient (EQ) and application quality index (AQI) into one scale. This was done by assigning maximum value of each dimension into 100 and changing the rest of the value accordingly. The EFEI is the average of the converted values of both the parameters. YouTube has the highest EFEI, closely followed by Amazon Prime Video.

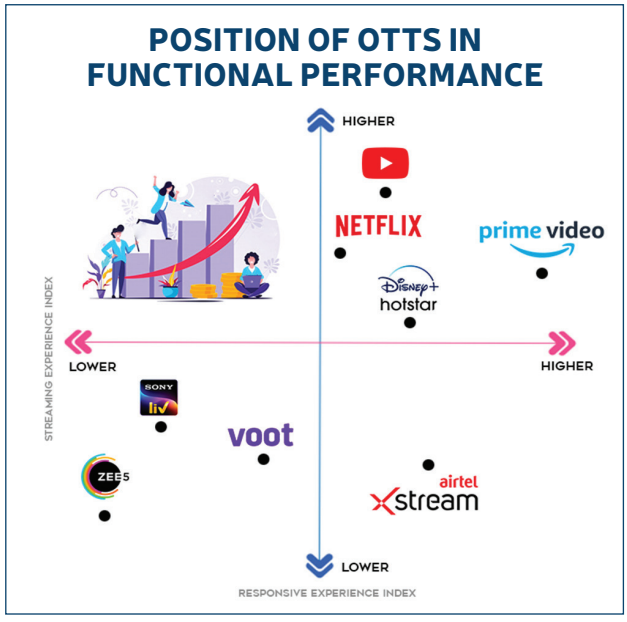
> The key factors of responsiveness are performance of the app backend, optimization of images and efficiency of personalization APIs/algorithms.

THE OTT TRENDS

#1

OTTs are making a good exchange instead of optimizing both responsiveness and streaming

Getting a reliable experience across the responsiveness of the app and the streaming performance is really difficult. The study revealed that the only OTTs that came close to achieving this are Amazon Prime Video, Disney+Hotstar, YouTube and Netflix.



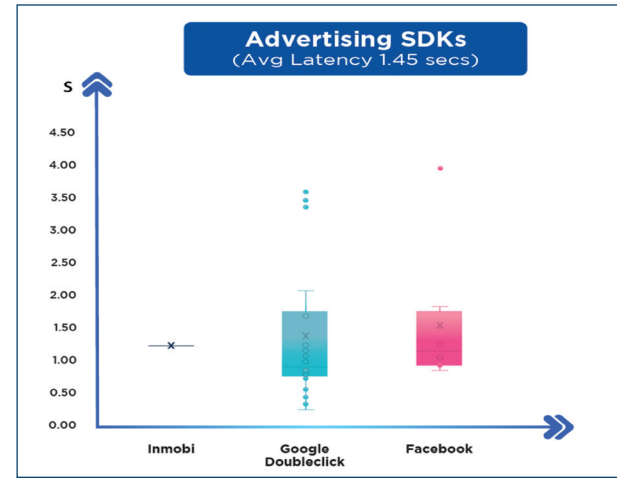
The key factors of responsiveness are performance of the app backend, optimization of images and efficiency of personalization APIs/algorithms. Streaming requires burst performance where a large amount of data needs to be downloaded in short period. Here is where the CDN pitches in. Using the most effective CDN as per the geographical distribution of customer is crucial. A CDN gives different experience in different geographical locations. Even within the country, CDN performance differs widely with respect to locations.

#2

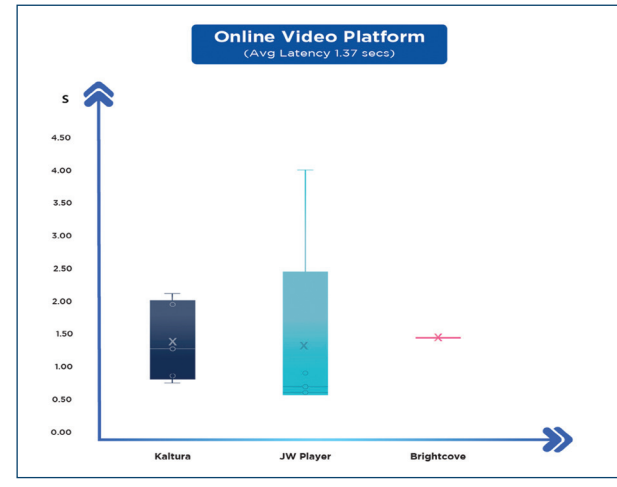
OTTs need to have to have greater control over third party infrastructure to perform better

For every 100 MB of data that is sent by a typical video app, only 10 MB is exchanged with its own backend. Remaining data is transferred by third party infrastructures such as CDNs, online video platforms like SDKs, marketing and customer analytics cloud, APM cloud etc. Understanding the impact that such third party integrations have on end user customer journey performance is very crucial.

Observations for Ad network SDKs



Observations for Online Video Platform SDKs



The study noted that of various available apps, the commonly used third party integrators include ad networks, marketing and customer analytics

cloud, online video platform cloud, and application performance management cloud. We observed the overall latency of these integrations and found that there is a vast latency variation across the board. The overall latency is defined as the sum of TCP handshake time and TLS handshake time.

Such high latency variations would have a profound impact on the performance of the app. These latency variations can be highly improved by transitioning to server side integration rather than client side integration. Server side integration leads to dedicated WAN connections to the respective third party clouds. By doing so, the communication between the client and server are limited to the app backend and the CDN.

#3

Choosing CDN is the an important decision

Content delivery network (CDN) delivers more than 60% of any video OTT's traffic. The distribution and performance of CDN have a more significant impact on the app performance.

Besides cost, several other technical factors need to be considered while choosing the CDN provider.

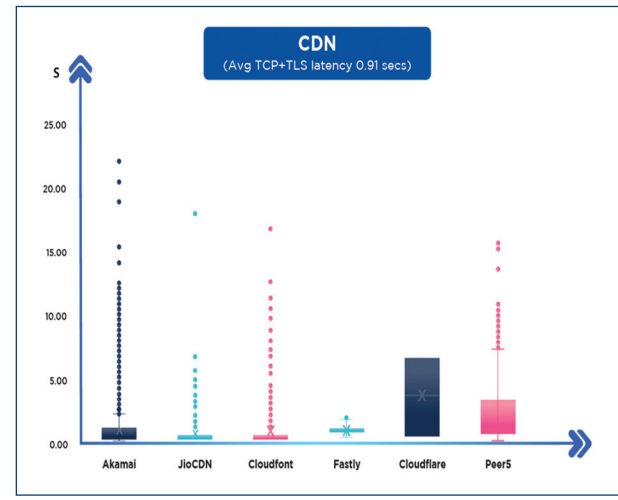
- Pops geographical distribution across the country
- Network Connectivity deployed at the pops
- Peak throughputs that can be delivered from the pops
- Caching capacity of the pops

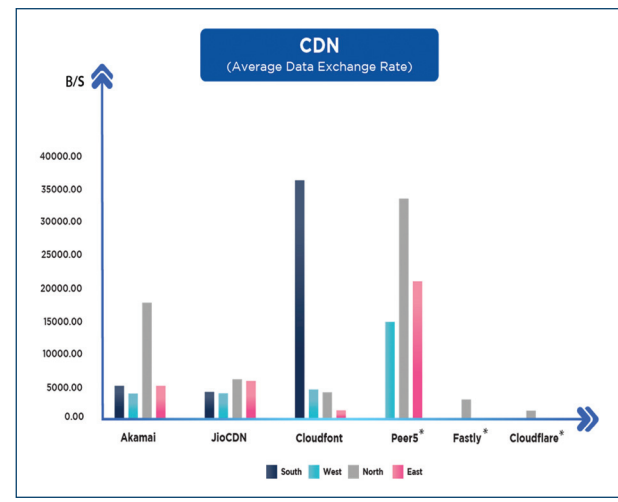
Based on our study on OTT, we observed Akamai, Cloudfront, Jio and Peer5 were the CDNs that were used. We analyzed the latency variations of these CDNs based on our test and found that cloud front displayed maximum variation across the tests we performed while Akamai was the most consistent player.

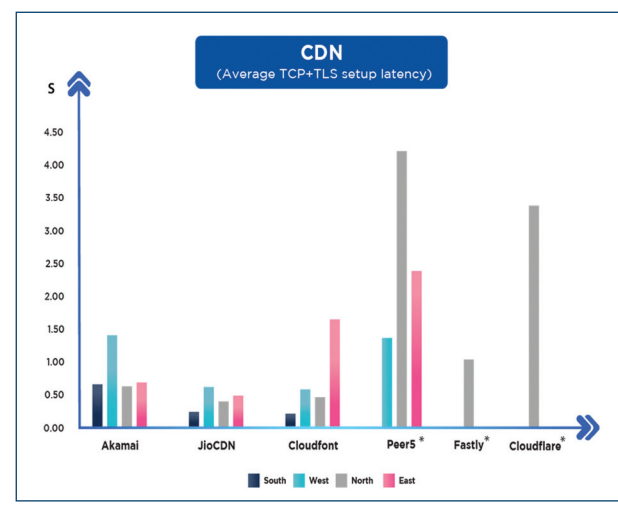
In terms of regional performance, all CDNs performed weakly in Eastern region which indicates that significant investment should be done to improve the CDN infrastructure across east.

Multi CDN architecture is catching the fancy of various OTTs, inorder to avoid locking with one partner and also leverage the performance variations across CDNs to choose dynamically from where to deliver content from.

Observations on CDN Performance







OTTs are integrating real time CDN performance intelligence with their load balancers to make such decisions on the fly.

> The first step in becoming a world class app is to start measuring user experience. After all what is not measured cannot be improved.

#4

APP architecture needs to take into account the variations in network latencies

Countries that have not invested in the vast fibre networks have relatively higher latencies. Countries with poor infrastructure also witness fibre cuts heading towards more congested network in an otherwise stable route. Lack of fibre infrastructure implies latencies even with 4G which will never match that of the more advanced counter parts.

In order to assimilate higher latencies, architecture needs to be framed while developing content apps. Limited bidirectional network calls between client and server is the crucial part. Chatty networking calls can result in very high overheads leading to overall slowdown of the app. Minimizing protocol overheads and maximizing time spent on payload transfer is crucial. For achieving an optimal network overhead by apps, their API architecture needs to be framed carefully to ensure that multiple requests are server with one connection establishment.

Conclusions

Global OTTs like Netflix and YouTube have invested heavily in not only creating content but also laying out their own infrastructure like international fibre networks and CDNs. Smaller OTTs, however, have not been able to make the same levels of investment in technology as majority of their investments goes into content creation. Hence, they have a need to integrate third party tools. Although not a challenge, deploying monitoring mechanisms to keep a tab on the performance of third parties and being able to enforce strict SLAs as part of their contracts is crucial for OTTs. Thus, the first step in becoming a world class app is to start measuring user experience. After all what is not measured cannot be improved.

The research report India's Top OTT Platform has been prepared by CMR and Mozark for Voice&Data.

About Mozark

Mozark is a digital experience platform that helps clients measure real experience by monitoring on real devices, connected to real networks. Its artificial-intelligence and machine-learning (AI/ML) engine helps to obtain insights to make app-improvements to deliver a rich experience and provide the best care to customers.

About CMR

CMR offers industry intelligence, consulting and marketing services, including but not limited to market tracking, market sizing, stakeholder satisfaction, analytics and opportunity assessment studies. Its bouquet of consulting services includes incubation advisory, go-to-market services, market mapping and scenario assessment services.

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INDIA'S TOP OTT PLATFORMS

#1

YouTube

YouTube is an American online video-sharing platform headquartered in San Bruno, California. The service, created in February 2005, was bought by Google in November 2006 for USD 1.65 billion and now operates as one of the company's subsidiaries. YouTube is the second most-visited website after Google Search. YouTube is the world's largest online video service and competes for user viewership in order to compete for digital advertising spend from businesses. It has over 265 million active users in India.

#2

Amazon Prime Video

Amazon Prime Video, or simply Prime Video, is an American subscription video on-demand over-the-top streaming and rental service of Amazon.com Inc., offered as a standalone service or as part of Amazon's Prime subscription. The service primarily distributes films and television series produced by Amazon Studios or licensed to Amazon, as Prime Originals (or Amazon Originals) or Exclusives, with the service also hosting content from other providers, content add-ons, live sporting events, and video rental and purchasing services. Amazon Prime has nearly 10 Mn users in India, of which only 40% of the users pay for their membership while others are members because of bundled subscriptions.

#3

Netflix

Netflix Inc is an American over-the-top content platform and production company headquartered in Los Gatos, California. Netflix was founded in 1997. The company's primary business is a subscription-based streaming service offering online streaming from a library of films and television series, including those produced in-house. The company closed the year 2020 with 4.6 million paid subscribers in India. Netflix has 25.5 million paying subscribers in the region, which translated to revenues of USD 685 million, a 64% growth over the previous year.

#4

Disney+Hotstar

Disney+ Hotstar is an Indian subscription video on-demand streaming service owned and operated by Star India, a subsidiary of The Walt Disney Company India. The service primarily distributes Hotstar originals, Disney+ originals, films and television series produced by Star, The Walt Disney Studios and Walt

Disney Television. Disney+ Hotstar made up 30% of the total subscription base of its global parent in December, double the 15% figure in August, as Indians flocked to the video streaming app for sports and big-budget movies. While Disney+ crossed 86.8 million global subscribers, 26.8 million of them were Disney+Hotstar users from India.

#5

SonyLIV

Sony Liv is a part of the network of television channels owned by Sony Pictures Networks India Pvt. Ltd. in India. It has access to 18 years of content from channels that are part of the Sony Entertainment Network. This has more than 700 movies and 40,000+ hours of television show coverage in Hindi, English, Telugu and Tamil. It also offers original web series like Scam 1992: The Harshad Mehta Story, Lovebytes, Married Women Diaries, JL50, etc. The application underwent a revamp in its appearance in June 2020.

#6

Zee5

Zee5 is an Indian on-demand Internet streaming media provider run by Essel Group via its subsidiary Zee Entertainment Enterprises. Zee5 launched in February 2018 with eight original shows, which has boomed to 87, by mid-2019. With the launch of 72 original shows recently, Zee5 gives strong competition to existing OTT platforms like Netflix and Amazon Prime. The Originals are available in nine languages, led by Tamil and Hindi. Zee5 has dubbed majority of its content in regional languages to maximize viewership. 39 of the Zee5 Originals are films, which includes both full-length and short films, most of them in Hindi and Tamil. The platform offers majority Originals in the genres of drama (33%), thriller (27%) and comedy (18%).

#7

Voot

Voot is an Indian subscription video on demand (SVOD) service. Launched in March 2016, it forms the online arm of Viacom 18. It is Viacom 18's advertising-led video-on-demand platform that is available as an app for iOS, KaiOS (JioPhone) and Android users, and a website for desktop consumption. Voot is available only in India, and hosts over 40,000 hours of video content that includes shows from channels like MTV, Nickelodeon and Colors. Content is also available in multiple languages like Kannada, Marathi, Bengali, Gujarati, Telugu and Tamil.

#8

Airtel Xstream

Airtel TV has no original content of its own at present. However, it more than makes up for this with tie-ups with some of the biggest VOD services have ensured the latest series and 10000+ movies of ZEE5, Eros Now, Hotstar, HOOQ, and ALTBalaji, and the regional players Hoichoi, and Fastfilmz are available on the app. Additionally, NDTV and Airtel struck a partnership whereby the world's first live channel NDTV Hop was launched for the millennial audiences. Airtel TV Premium was launched in October 2018. This subscription includes access to 300 exclusive titles and a 10,000+ catalogue of TV shows, live channels, and films.

5G is peanut butter, unless...

Every good thing has a hidden side, one that surfaces slowly and, often, when you least expect it. Be cautious when pushing the button on your big 5G project

BY PRATIMA HARIGUNANI

The funny thing about allergies is that you have to go through that swollen lip or the nasty itch before you discover – Ha! That's one thing I cannot enjoy.

So when something totally mint-fresh hits the grocery stores or IT-shelves, this thought never pops in your mind except for hypochondriacs or consistent allergy-sufferers. How in the world are you to know if the new super-food that is making so much Instagram-buzz out there is going to hit you with a teary-eye. How in the world would you know if the amazing next big thing called 5G can hit you with a security mishap!

Bite 5G with care

If you ask Sophos Senior Vice President Sales for APJ Gavin Struthers about the vulnerabilities that may arise from a cybersecurity perspective when one thinks of 5G networks, he will not mince words and tell you that "Similar to 3G and 4G, a lack of visibility with 5G may be an issue, owing to its speed and potential to move exponentially more data, with connectivity that will surpass current broadband, visibility will be a bigger issue than ever before."

Struthers explains that, at best, we'll be able to see whether a device is using a 5G radio, in a 5G environment. "However, there will not be any visibility into what's actually being transmitted over that radio, making it challenging to spot suspicious activity. We will be able to monitor 5G radio activity with a spectrometer, for example, but we won't be able to distinguish between good versus malicious 5G activity, since we simply will not be able to see what is included in that communication path."

> We can monitor 5G radio activity but cannot distinguish between good versus malicious 5G activity since we can't see what is included in that communication path.

That is not a small question to ponder. The scale of this invisibility zone can be quite consequential as we watch 5G taking deeper and deeper roots ahead. As per a recent Ericsson Mobility Report, four out of every ten mobile subscriptions in 2026 will be 5G. The current 5G uptake in subscriptions and population coverage iterate that the technology is deploying at the fastest rate – better than any generation of mobile connectivity.

In fact, by the end of 2020, more than one billion people will have access to 5G coverage globally. The report also mentions a 3.5 billion 5G subscriptions forecast by the end of 2026 – estimated to account for more than 50% of mobile data traffic at that time. If we look at India, 5G subscriptions are slated to surpass 350 million, accounting for 27% of all mobile subscriptions in 2026. However, when you look at how the 5G phenomenon translates for enterprises, the story is extra-large and extra-serious.

The Ericsson Mobility Report also indicates that critical IoT, intended for time-critical applications that

The 5G security impact

Most devices in enterprise environments don't have 4G chips in them, since 4G isn't significantly faster than Wi-Fi. 5G technology, however, will improve on its predecessors with faster speeds, higher bandwidth and lower latency, which will likely make it more common than 4G ever was.

While the faster speeds definitely have their advantages for users, they'll also cause disadvantages, since hackers will be able to exploit its speed. For example, an attacker covertly gains access to a photocopy machine that has a 5G radio due to the lack of visibility, and as a result can access all the sensitive information on the machine.

Helped by the bandwidth and speed of 5G, the attacker then quickly exfiltrates all that data – without raising a single red flag. If and when the compromise is identified, it's too late.

Another unfortunate, but very real truth that organizations need to face is the possibility of there being an advanced attacker in their network, who is already looking for additional ways to reap more financial rewards.

5G doesn't require hackers to be more skilled, since they can use the same attack methods to enter the network. But, 5G does provide an opportunity to do much more damage, since they can exfiltrate massive amounts of data a lot faster than ever before.

Source: Sophos

Fighting 5G security threats

Lock the backdoor: 5G can create a backdoor to your network. Think about network segmentation – what is permitted in the environment – and plan for an internet-facing IT infrastructure. Make sure there is visibility into everything. This doesn't mean it needs to be tightly managed, instead that you have visibility and can be managed as much necessary.

Trust no one: Use a zero-trust approach and insist on no-exceptions visibility

Use tailors: Adopt tactics and solutions that work for 5G-spots – like dynamic threat correlation, threat lifecycle management, customizable access and privilege management

Know what is on the network: Discover unmanaged devices in the environment. This may be a challenge if they're only communicating through 5G, but if they're also on Wi-Fi, they can be discoverable through network scans. Unmanaged devices can also be discovered through an EDR product, which observes all network connections to and from managed devices. Doing a query to find all communications to and from an unmanaged IP or MAC address could provide that discovery.

Get the basics right: Good old-fashioned encryption and access controls provide a good level of security for data and access to it.

demand data delivery within a specified time duration, will be introduced in 5G networks. This will enable a wide range of time-critical services for consumers, enterprises and public institutions across various sectors, with 5G public and dedicated networks. Similarly, FWA connections are forecast to grow more than threefold and reach more than 180 million by the end of 2026 – making to about a quarter of total mobile network data traffic.

As Ericsson's Market Area South East Asia, Oceania and India Head of Network Solutions Nitin Bansal pointed out in a recent report briefing, "5G has the potential to transform industries and society at large – with use cases such as smart manufacturing, smart cities and advanced healthcare applications, just to mention a few. As the technology proliferates, early movers stand to benefit by gaining the right experience and creating new use cases of relevance to their business. The companies and countries taking an active role in shaping and securing the 5G ecosystem in the early years have great potential to lead use case scaling once the market takes off."

That means a lot of gains would be lying in the front row of this technology-adoption. But the first ones to arrive are also the ones to take the arrows. Can enterprises find a good trade-off between an early-mover's risk and early-mover's gain?

The security risk is especially high with unmanaged devices, since hackers may be able to exfiltrate data, undetected. But there are still challenges involved with managed devices too. Hackers may not be able to go completely undetected throughout the attack, but they

> Security risk is high with unmanaged devices since hackers may be able to exfiltrate data undetected. There are challenges involved with managed devices too.

could still use the 5G backchannel to exfiltrate data. Regardless, it's nearly impossible to manage the risks if you don't know what exists and what's happening within your environment, hence why lack of visibility within 5G environments will be a meaningful problem, Struthers cautions.

Another report, this one from Research and Markets, also underlines that 5G presents more security risks, as criminals may be able to exploit flaws in the 5G network, such as virtualization vulnerability. "As 5G connects numerous devices, from conventional devices used in enterprises to IoT devices used in OT and commercial environments, the potential attack surface expands. Compromised IoT-based DDoS attacks and other attacks that exploit endpoint/device application vulnerabilities are expected to increase."

Yes, a key part of the 5G surface is the proliferation of IoT and sensors empowered by the new technology. Also a lot of the enterprise-intelligence will move towards the edge as 5G makes more and more room for low-latency applications. This is where cyberattacks will turn nastier because they can be intelligent, automated and defense-aware – all the while tapping into a big playground that is under the radar for most control rooms. 5G adoption will also be gravitating to mission-critical systems so the lure of cyber-espionage and handicap-them attacks would be all the stronger. These attackers can also exploit M2M devices, IoT points and edge spots as their own weapons by using adversarial AI and weaponsiation.

In fact, Unit 42 2020 IoT Threat Report points out that almost 98% of all IoT traffic is unencrypted with heightened exposure of personal and confidential data on the network, while as much as 57% of IoT devices are vulnerable to medium- or high-severity attacks. "We found that the general security posture of IoT devices is declining, leaving organizations vulnerable to new IoT-targeted malware as well as older attack techniques that IT teams have long forgotten," the report says.

Can you pop some pill?

What's the solution to the threat-aspect of 5G then, if any? Organizations may stipulate for IoT devices in the environment to be connected to the corporate Wi-Fi to gain visibility into traffic and to notice anomalous communications. Struthers suggests that if you can put an agent on manageable devices, you'd be able to identify that something unmanaged is talking over the 5G radio. "However, this does not imply that you will be able to decipher what that device is actually saying, making it incredibly difficult to spot attacks while they're occurring."

Basically businesses and network operators will adopt a shared security model, similar to public cloud security – as the Research and Markets report surmised. "DDoS protection is likely to become the most important component of 5G security, as the number of devices connecting to a network grows each day. As these devices are often vulnerable to exploitative attacks, organizations will have to invest more in vulnerability management capabilities to prevent volumetric DDoS attacks. A conventional security approach may not offer adequate protection when bandwidth usage increases." It is time to seek scalable and automated security solutions – maybe, with AI-/ML-powered threat detection-and-response capabilities.

All said, businesses shouldn't avoid using devices with 5G just because there are potential security risks. Instead, they need to understand that 5G will soon become inevitable in the business environment and therefore the best thing to do is take the necessary precautions to secure the corporate infrastructure, opines Struthers.

The arrival of 5G will highlight the need for protection at every layer of the environment, and businesses will benefit from taking advance precautionary measures. "5G will be another exciting disruptive and enabling technology. It will be your friend but be clear on making that friendship does not disappoint by implementing a pragmatic risk approach to its implementation in your environment."

Perhaps, he is saying – do not be paranoid but be aware when something swells up at the wrong place. When you dig into something new, be ready for everything –warts and all!

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The (relay) race is on for the CSPs

Communications service providers can learn from the best practices of successful relay race teams to capture a significant piece of 5G market opportunity

BY CHANDAN GOVINDARAJULU

The most successful relay race teams don't just have exceptional individual talents, they also bring out the best in one another, offer complementary skills, and execute as a cohesive group. With 5G, Communications Service Providers (CSPs) need to take a similar "relay race" approach to select the right partners to develop and drive new services leveraging the larger ecosystem. The adage that the whole is greater than the sum of its parts rings true in 5G.

5G opens a world of new possibilities for businesses, whether for replacing current IT, transforming their operating models, or creating new and innovative products and services for their customers. But developing these solutions and being first to market requires a new mindset for CSPs and new ways of fostering collaboration across the ecosystem. According to recent reports, 5G could be a reality in India by this September. CyberMedia Research expects 11 million 5G smartphones to be shipped to India in 2021, and it is estimated to touch Rs 19,053 billion by 2025.

Survey findings from BearingPoint Beyond indicate that 60% of CSPs believe collaboration helps drive cost-effective, innovative solutions and that businesses need an average of nine partners to support their 5G use cases.

> Dropping the baton in a relay race usually means the last-place finish. It's no different for CSPs as they need to create a frictionless model for rolling out new services.

Nine partners – that's taking the relay team analogy to another new level of coordination and requires new approaches to how CSPs and partners work together.

To capture a significant piece of the 5G market opportunity, CSPs can apply five best practices from successful relay race teams.

Smooth hand-offs make the difference

Dropping the baton in a relay race usually means the last-place finish. It's no different for CSPs as they need to create a frictionless model for co-creating, testing, and rolling out new services. Ensuring smooth hand-offs and collaboration requires having a forum for CSPs and partners to experiment and innovate with speed and efficiency. Every millisecond counts in a relay race, and the 5G opportunity is no different.

Trust your team or find new teammates

Each member of the relay team plays a vital role in the overall success of the group. Successful teams have complete trust in one another to do their part in the race – with passion and consistency. By aligning with the right ecosystem partners, including those they have existing relationships with CSPs can effectively bring the right products and services to market. Part of the equation for 5G is leveraging existing solutions, building blocks, and APIs and adding new capabilities or different combinations to quickly introduce relevant services.

Stay focused on the future

The outgoing runner can't look backward when receiving the baton, which adds a challenging aspect to the race. An effective non-visual hand-off can mean the difference between winning, losing, or disqualification. The same goes for CSPs when looking for inspiration and insights to drive the next generation of 5G services. The best place to capture those insights early on will come from direct interaction with businesses and consumers. If you're not working on something they will soon need, move on. There's so much room for future innovation that winning CSPs will have a strong instinct for identifying those future opportunities, along with the determination to deliver new services just as clients realize they need them.

Timing is everything

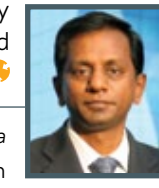
Some CSPs are more agile than others when identifying a market need and executing on it. Depending on the customer or opportunity, CSPs need to determine what it takes to get to market early or first. In those situations, CSPs want to team with those quick and nimble partners. In some cases, it'll be more important to develop an end-to-end solution versus being first. Understand the customer and market demands, set realistic milestones, and meet those timelines.

To quickly shift from being a product-centric organization to a customer-centric one, CSPs must be willing to change their strategic priorities and their internal processes to collaborate with both business customers and third-party partners properly.

Have a great coach

Effective coaching runs deeper than wins and losses. It also includes reaching athletes on an individual level. Having a strategic coach (leader) is critical in tapping into the right areas of expertise – and understanding the team's strengths and weaknesses. Team roles, including the coach, need to be clearly defined from the start. While every team member needs to believe in one another and have an agreed-upon set of goals, the coach needs to ensure everyone brings their best to the table. From setting goals to motivating the team, a great coach will look at the big picture, allowing the team to focus on execution. The ideal coach brings out each team member's best and requires a unique set of skills and experiences.

While these best practices in one form or another are widely acknowledged by leading CSPs, one big challenge remains: How to enable a level of collaboration that doesn't exist in the market today? An ecosystem-led strategy in 2021 and beyond will allow CSPs to solve genuine problems for customers and open up fresh opportunities for co-created solutions supported by ground-breaking business models and attractive revenue share arrangements.



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Murtaza Bhatia
National Manager – Vertical Solutions, NTT Ltd.

"The 5G to 6G shift will happen in steps"

As per NTT's 2020 Global Managed Services Report, organizations indicated that MSPs will provide maximum value during the next 3-5 years through their security capabilities (44%), financial stability, trust and reputation (43%), and automation (43%). ***Murtaza Bhatia****, National Manager – Vertical Solutions, NTT Ltd. India, in an interaction with* ***Pratima Harigunani*** *gives a quick peek into what transpires as the global behemoth undergoes a big internal redesign. He also points out the state of cloud, low-power innovations, photonics, industry collaboration and 5G from a practical and poised lens.*

A lot of internal transformation has been happening at NTT recently. What opportunities and challenges emerge as things reshuffle in such a big way?

We are a company with a 150+years' heritage, present in over 80 regions and countries with over 190 network coverage regions. After 2019, a large consolidation drive began between group companies. We are combining forces and galvanising strengths across the spectrum. We are offering digital transformation, customer experience, omni-channel connectivity, intelligent workplaces – everything.

Earlier, every company within the group had a different play in the IT space. Now, combined in a new way, they have an end-to-end advantage. With NTT and NTT Data, there is nothing in the ICT landscape that we cannot handle. Our joint GTM advantage is now bigger and better.

With about USD 3.6 billion in R&D, you clearly have a big focus on the future. Can you share more on the exciting work that is on its way?

We are enabling the future for our clients. That is what our R&D does. We focus on digital transformation, flexibility and outcome-based services. To bring about and deploy 5G service, we have expanded initiatives in the DOCOMO 5G Open Partner Program aimed at creating new usage scenarios with a broad range of partners. Also, in our 5G field tests we are advancing initiatives aimed at realizing 5G usage in a broad range of environments, and achievements include becoming the first in the world to successfully realize a data transfer speed of 27Gbps to mobile terminals, exceeding the 20Gbps required by 5G.

With large capacity optical networks expected to evolve further to facilitate the widespread use of IoT and 5G services, we are newly developing our own digital signal processing and ultra-broadband optical device technologies, and we have become the first in the world to successfully test the long-distance transmission of a wavelength division multiplexed optical signal. We also successfully used two technologies for the wireless transmission of volumes that were about 100 times greater than LTE or Wi-Fi and five times greater than 5G. In addition to these, we are advancing cutting edge research, such as the joint development with a university of an ultra-high-speed integrated circuit that enables wireless transmission.

Do you think the world will hop from 5G to 6G quick and easy?

The 5G platforms are already ready as per NTT's roadmap. The research in 6G areas and applicability is going on. In India, it will take a year or more with 5G because of diversity and service providers. The 5G to 6G shift will happen in steps. Currently 5G is enough for use-cases and business requirements. The business models based on 6G will still take some time.

> We are the first in the world to successfully realize a data transfer speed of 27Gbps to mobile terminals, exceeding the 20Gbps required by 5G.

Can you yell something about IOWN – Innovative Optical and Wireless Network (IOWN) – in context of the current optical fibre revolution?

It is of great importance. It is the backbone of the entire revolution. IOWN will help a lot of interconnects and also revamp with under-sea cable which is of great significance.

NTT R&D is envisaging the arrival of new smart societies that are not yet possible with today's internet, with features such as mobility as a service (MaaS) for extreme fail-safe systems and entertainment services offering deep immersion. To realize such smart societies, we will require innovation that cannot be achieved merely by extending the trajectory of current technologies; we will need to realize ultra-low power consumption, high-speed signal processing, and the fusion of virtual worlds that can equal or surpass reality with sophisticated prediction technologies. NTT Group has proposed the IOWN concept to realize new smart societies, and we are making a committed effort to realize this concept.

IOWN comprises three main technology components: an "all-photonics network" that uses optical processing on not only networks but also device processing; "digital twin computing" that enables high-speed, real-time interaction between things and people in cyberspace; and "cognitive foundation", in which these and various other ICT resources are efficiently managed. NTT Group aims to solve social issues by aiding the shift from electronics into the world of photonics.

How much has your strategy been affected due to competition from new-breed players – specially the tech giants?

I see it not as competition but co-existence. Not everyone can go on cloud and not everyone can stay on-premise. It has to evolve to a hybrid shape. It is about how workloads can be actually made to run better – that's a good SI's work. What if an enterprise's workloads are at all types of clouds. Some footprint goes to co-location and some goes to Edge. Everything boils down to best and efficient-workload management; neither underperformance, nor over-performance. That's our play.

When it comes to cloud, we provide enablement services from legacy to private and public cloud. We take care of what goes where and strengthen the set-up. The intelligent security piece is also a good one in this space.

Would the NEC-NTT equation trickle into India?

Yes, it does. Depending on business alignment, it reflects in almost all countries. But right now nothing country-specific can be said. The alignment is going on.

What kind of sustainability goals are in progress and how do they align with innovation directions in 5G, 6G, Edge and optics?

NTT Group announced in September 2016 its endorsement of the UN's Sustainable Development Goals (SDGs). Our group companies have identified the correlations between their businesses and the 17 goals of the SDGs, and are making efforts toward their achievement.

As Moore's law approaches its limit in electronic circuits, there are expectations for a new, high-speed, energy-saving computing platform that incorporates optical technology. Achieving this requires technologies that have hitherto been considered difficult to achieve with low energy consumption, such as opto-electronic signal conversion and high-speed signal processing in the optical area. NTT has been developing a semiconductor nanostructure called photonic crystals with which to realize various tiny optical devices. In this work, we used our nanotechnology to realize a nano electro-optic modulator (E-O converter) and a nano photodetector (O-E converter) with extremely small capacitance and low energy consumption. Moreover, through their integration, we also realized an O-E-O conversion optical transistor. These nano-optical technologies have opened the way to realizing high-speed, low-energy integrated, opto-electronic information processing.

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5G AND BEYOND: THE DIGITAL FUTURE

Discussion around higher speed and performance of 5G over its predecessors tend to miss the forest for the trees. Studies reveal greater RoI over short term from private networks

As India races into a digital future, 5G will assume a critical role in not only enabling enhanced and specialized applications of increasingly modern communications technology, but also, for the first time, provide new types of socio-economic benefits in many industry verticals. Not only does the technology offer the means to connect users to a high-performance network, it also enables use cases that offer greater and unprecedented value.

While the advent of the public internet offered connected users a revolutionary way to exchange information, it was in a largely static form. It was, however, a significant departure from the technology of the day and ushered in an unimaginable era of innovation and progress across sectors and economies. With ever increasing demand and potential of video services, 5G is poised to usher in a similarly significant evolution from 4G. Its ability to carry large amounts of traffic make it an ideal vehicle for the distribution of video-based applications and services for the growing urban appetite as well as for the accelerated adoption of communications services in rural areas.

The real time features of the technology enable industrial use cases that enhance networks' ability to

> 5G is not only the fifth iteration of mobile communications technology for humans, but also the first true generation of communications technology fit for machines.

address challenges faced by businesses around the world. It is perhaps for this reason that conversations about industrial 5G tend to evolve into discussions about industry 4.0.

Recently, Nokia CTO Randeep Raina made a compelling case for 5G as not only the fifth iteration of mobile communications technology for humans, but also as the first true generation of communications technology fit for machines. This is a great expression of the uniqueness of 5G. The ability to integrate machines into communications networks is not novel, but 5G is the only communications technology that comes close to offering a level of performance and mobility deemed suitable for use in modern machine-to-machine and internet of things (IoT) use cases. With increasing demand for real-time connectivity across demographics, devices, sensors and automation protocols, successful applications of industrial 5G will deliver solutions that effectively capture the value up for grab.

Much of the cynical prognostication around the development of adoption of 5G in India draws comparisons with the lacklustre performance of 3G technology in the nation, the lack of a large-scale business case for public 5G, or the fact that no trials have even taken place yet. While it is true that many nations began the testing of significant 5G rollouts over two years ago, it is also true that their experiences offer crucial lessons for others now seeking to rollout such networks, obviating, to a large degree, the need to carry out expensive trials.

It is also true that a large scale 5G business case has so far eluded providers in markets where limited deployments have been in existence for over a year. At the same time, as also pointed out in a 2020 Ericsson consumer and market insight report, even in a pandemic hit global economy, one out of every three early adopters is still willing to pay a 20% premium for 5G.

Additionally, it is important to note that numerous applications of 5G private networks are revealing better returns on investment than public 5G over the near term.

5G can be effectively deployed in a range of environments to an equally wide variety of ends. For manufacturing, the technology can help optimize connectivity to industrial control equipment, enable real time control of robotic equipment, provide reliable video training and support to workers across the facility, integrate reporting of process efficiency using video and sensors, as well as AR applications that provide support for critical industrial processes. Current robotics and automated machine protocols are routinely connected using Wi-Fi, limiting their movement through the factory floor, a limitation of technology and application that can be adequately addressed by 5G. Companies such as Siemens

> Service providers can directly generate USD 131 billion by 2030, from digital service revenues by proactively developing and marketing 5G use cases.

and others are aggressively pursuing such designs and are investing in infrastructure and spectrum. Volkswagen aims to deploy 5G across 122 factories by 2021.

5G networks can also be deployed in a private setting for a wide variety of healthcare applications. The data generation and harvesting capabilities of modern technologies enabled by 5G can drastically improve healthcare outcomes. At a minimum, the technology would allow for seamless video based remote diagnoses. At its peak, it would enable the administration of remote surgical procedures. Given the large number of devices and data endemic (no pun intended) to the practice of healthcare, the use of 5G to collect, process and act upon insights is bound to be invaluable.

Service providers should also pay attention to the needs of educational institutions, as well as the role of private 5G networks in educational and corporate campus settings.

The nature and reliability of 5G help it create immense value when applied in special scenarios and is a clear opportunity for service providers to partner with technology companies to enable such rollouts till public 5G reaches a significant level of market maturity. According to Ericsson, "Service providers can directly generate USD 131 billion by 2030, from digital service revenues by proactively developing and marketing 5G use cases. Key opportunities lie with enhanced video, advertising, in-car connectivity and extended reality."

In its report "Industries and enterprises are ready to reap the benefits of 5G", Omdia reveals that of the global enterprises surveyed in its study, 71% believe that 5G networks are set to have a significant impact on their business and help create new commercial and business models. It also reveals that nearly three fourths of the globally surveyed telecommunications service providers believe that most 5G revenues will be derived from B2B, B2B2C or government/smart cities opportunities. The report concludes that telcos can "become 5G ecosystem orchestrators and be the anchor provider of solutions that will indeed include traditional core connectivity but which will extend and encompass applications and services required in the 5G era", and that capturing this value would rest on securing and fostering key partnerships with an ecosystem of alternative providers, system integrators, and application developers.

For India to realize its digital vision, it must now look to 5G and beyond. As the first truly fit-for-purpose communications technology that can be effectively deployed for machines, 5G will enable staggering levels of operational efficiency in a wide variety of industries. For retail consumers, the technology would offer unparalleled connectivity that can cater to a media heavy digital lifestyle. 5G can also be suitably deployed in rural settings for the development of community led approaches that maximise local impacts, making it ideal for furthering the rural development agenda.

A proactive approach to the development of technologies that lie beyond 5G is essential for the preservation of India's digital ambitions. Cultivating a business-friendly environment for investments, both domestic and foreign, ensuring domestic technology development as well as participation in global standardization efforts will be crucial, since 5G would indeed be the threshold for new generations of development and opportunities and propel us into a future previously limited to science-fiction.

India must ensure a development-focused but business-friendly approach to successfully reap the rewards associated with assuming a leadership role in the emerging exciting digital world.

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Driving the home network connectivity

Wi-Fi 6E is likely to hit its stride in 2022-23 timeframe as the spectrum is released around the globe and clients and applications start to arrive

BY KANNAN KRISHNAN

As we move ahead in 2021, consumers are adding even more connected devices to their homes. Smart assistants, smart plugs, security cameras and doorbells are becoming some of the popular additions to our connected home. This continual increase in devices accumulated with most of us still working and schooling from home has shown how important connectivity is to our homes. If you did not believe that Wi-Fi and internet connectivity was a new entry in Maslow's hierarchy at the physiological needs level (i.e., air and water) before the pandemic hit, then you probably believe it now.

As we look forward to the year and the potential for a return to pre-pandemic normal in the second half of 2021, we still see a lot of the acceleration of digital services staying with and accelerating into 2022. Here are some of the most important home network trends to follow.

Wi-Fi reliability and performance

Consumers are now not satisfied to just connect with poor performance in many rooms of their home. With the pandemic turning all our rooms into work and school places, we now see the importance of high-performance Wi-Fi to every part of our homes. With the arrival of Wi-Fi 6 technology and its 15-35% boost in overall home performance over previous Wi-Fi 5 solutions, we see a sharp growth in the roll out of more Wi-Fi 6 access points from service providers in 2021. While legacy client devices prevail and don't fully unleash the 4x performance improvement of Wi-Fi 6 – the importance of Wi-Fi 6 to create a new Wi-Fi foundation for the home cannot be overstated.

New Wi-Fi 6 multi access point meshing solutions coupled with Wi-Fi management software solutions will also become the norm as even the smaller homes improve performance with Wi-Fi extender solutions. Wi-Fi extender devices will become commonplace in most Indian homes. Reliability of these solutions needs to be controlled by cloud and consumer app-based solutions that self-heal where possible and present both the service provider support representative and the consumer the ability to solve remaining problems.

Capacity improvements on networks to the home

We have seen more than a 50% increase in upstream traffic in the last nine months of 2020 as work, education and everything else in our lives moved to home. The use of video conferencing and shared cloud storage has shown how improved upstream and downstream capacity can improve our ability to compete and live in this accelerated digital economy. We also see an increased momentum to shift from 1Gbps GPON solutions to 10Gbps XGS-PON to be prepared for future services. The 5G spectrum auction and network roll out by telcos will also result in sharp increase of broadband access to the remotest parts of the country.

Overall, the service providers are moving towards becoming the super aggregator of home services.

- **Aggregated streaming services:** The past year saw

> While legacy client devices don't fully unleash the 4x performance improvement of Wi-Fi 6 – Its importance to create a new Wi-Fi foundation for the home cannot be overstated.

ever more consumption of OTT video streaming services, with lock-down binge viewing and movies going straight to streaming. With ever-more OTT service coming online, the need to aggregate these services and simplify the consumer experience grows. While service providers have integrated streaming services with their own Pay TV offerings for a while, there will be increased focus on addressing the broadband only customer with operator-supplied streamers. A move that will accelerate the shift by cable operators from QAM-based video delivery (traditional cable STB) to all IP-video services in the home.

- **Smart assistants:** With smart assistants maturing to a point where they can now be added as S/W integration into devices we see an acceleration of multiple assistants co-existing in a single device in the home. Solutions like the Voice Interoperability Initiative (VII) are breaking down the technical and user interface barriers to allow a service provider smart assistant to work cohesively with all the commercially available ones. With consumers also worried about their privacy with smart assistants there will be increased focus and innovation to address this, helping consumers get comfortable and drive further adoption of digital assistants.

- **IoT services:** With the momentum of the Connected Home over IP group (CHIP) and their work we expect to see this effort result in the ability for a single hub in the home to create IP connection for all internet of things (IoT) services and applications. This will remove some of the fragmentation and deployment issues of smart home solutions and simplify the user experience. It also provides a unique opportunity for the service providers to provide the home IoT aggregation function for all home services.

- **New home solution services:** Service providers have long waited for the opportunity to be able to push new services to the devices they have invested in and deployed to consumer homes. The year will see the emergence of platforms capable of deploying new services from the cloud such as IoT, security, smart assistants and low latency on an on-demand basis in a standardized, easy to deploy framework. This will drive innovation and revenue growth opportunities for service providers.

Whole home and every-room media consumption will also normalize on the service provider platforms with every room capable of accessing all media from audio services to video services with simple device additions to each room providing a whole home and cross home experience.

Virtual doctor visits, telemedicine and aging in place are three of the areas that have seen huge acceleration in investment as we move towards more digital and technology solutions for the home versus having to traveling to the doctor's office during a pandemic.

Moving towards more reliable deterministic and low latency services

It would have been hard to miss the announcements this year on the allocation of 6GHz spectrum to unlicensed use. With the United States and other countries allocating as much as 1.2GHz of spectrum unlocking 66Gbps of wireless potential for use in the home. With the creation of the Wi-Fi 6E and first products available to use this newly approved spectrum, we will see new products in 2021 that will use this huge capacity of spectrum for an array of applications. We expect Wi-Fi 6E to hit its stride more in the 2022 and 2023 timeframe as the spectrum is released around the globe and clients and applications start to arrive.

With this new 6GHz spectrum also comes determinism of performance on Wi-Fi for the first time – matching that of a wired connection. We expect to see new revenue generating use cases emerge on this ultra-low latency determinism from "no excuses best latency gaming" to providing the underpinning platform for latency intolerant AR and VR experiences. Knowing your latency score on your network will become as important as the bandwidth from your service provider.

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[COMMENTARY]
POLICY

Give contact center service providers their due

Time is ripe for the DoT to define clear guidelines for the third-party contact centers in India. Any further delay will impact services in several vital sectors

BY BALBIR BORA

In November 2020, the Department of Telecom (DoT) in India decided to drastically simplify the Other Service Provider (OSP) guidelines. Firstly, the registration requirement for OSPs was done away with and the BPO industry engaged in data related work has been taken out of the ambit of OSP regulations. In addition, requirements such as deposit of bank guarantees, requirement of static IPs for work from home (WFH), frequent reporting obligations, publication of network diagram, penal provisions, etc. have also been removed.

Experts believe that the new framework would provide a strong impetus to India's IT and ITeS industry and will make India one of the most competitive ITeS jurisdictions in the world.

As on today, there are numerous global and local third-party Contact Center Service Providers that are servicing this growing outsourcing industry. This is a big business in India with multiple kinds of customers being serviced by these omnichannel platforms. Yet, there is no suitable category of DoT license or framework for these service providers. All of these operators are unregulated by the DoT and despite being a big business it is in the grey area unless the department comes out with new rules for the Hosted Contact Center business.

The regulatory outlook

In their recommendation paper on 'Review of T&C for Other Service Provider (OSPs)' and subsequent exchanges with DoT in 2019 and 2020, the Telecom Regulatory Authority of India (TRAI) addressed the matter of third-party contact centers in India and recommended a regulatory framework for this category of service providers to DoT.

Defining these service providers, TRAI said: "There are service providers who have set up data centers/ facilities for providing the infrastructure required for setting up of a call center/ contact center instantly. The service providers who offer these services directly from their data centers are termed as Contact Center Service Providers (CCSP) and those service providers who have hosted their services over cloud and are providing these services using internet are termed as Hosted Contact Center Service Provider (HCCSP)." It is to be noted that this definition of a Hosted Contact Center covers the cloud-based platforms and also cloud telephony services present in this space.

TRAI recommended DoT to set-up a registration framework for such service providers.

- **CCSP/ HCCSP who provide the Contact Center platform:** Such service providers would have to take

> Experts believe that the new framework would provide a strong impetus to India's IT and ITeS industry and will make India one of the most competitive ITeS jurisdictions in the world.

a registration from DoT, similar to what OSPs had in the past.

- **CCSP/ HCCSP who provide the platform as well as telecom resources to OSPs:** Such service providers are required to obtain the suitable category of VNO license under UL (as applicable) from DoT, on top of the registration.

We believe that these recommendations from TRAI will be taken by DoT as the foundation and building blocks for formulating guidelines on CCSP/ HCCSPs in India.

Impact of DoT's new OSP guidelines

In the past, the acceptance of Contact Center technologies for use in OSP operations was a matter of contention with the DOT due to ambiguous nature of the official OSP guidelines.

After the aforementioned exchange with TRAI, the DoT came up with the new OSP guidelines in November 2020 and simplified the entire framework for easy governance in this sector. However, not much changed in the regulation with respect to usage of cloud-based/hosted platforms for OSP operations. The reason is that the topic of Contact Center/ Hosted Contact Center technologies has not been touched upon by DoT in the new guidelines.

Even though the new guidelines are silent on the CCSP/HCCSPs, there is acceptance for architectures with 'foreign EPABX' for international OSP operations, which was also a matter of contention earlier among various LSA. It is our understanding that the foreign-EPABX can be owned by the OSP company itself or a third party such as CCSP/HCCPS.

What should a new player keep in mind?

If you want to setup a contact center and/or hosted contact center in India, here is what you should know. The security conditions levied by the government in the new OSP guidelines emphasize on local storage of call data records (CDR), system logs, and system configurations in a tamper proof format. It should be possible for the OSP company (and by extension, the CCSP/HCCSP) to provide access to this data to DoT, as and when required. It should be possible to facilitate DoT with complete traceability of the voice traffic to ensure that no violations are being committed.

CCSP/HCCSPs hence need to relook their network architecture and business model to ensure compliance to the security guidelines mentioned in the OSP regulations 2020 and also with the Indian data privacy laws (which are under consideration by the government at the moment and can come into effect soon). It should be possible to facilitate DoT with complete traceability of voice calls. Any secure infrastructure for enabling working from home should be hosted in India only. In conclusion, compliance to the security conditions and data privacy conditions should be the foremost consideration for a new player.

What does the future has in store?

In the absence of a valid license for running hosted telephony services, TRAI's recommendation on CCSP/ HCCSPs should be taken into consideration by the regulator to build a strong registration and licensing framework for such technologies. There is a huge amount of business services dependent on CCSP/HCCSPs in the banking, insurance, medical, real estate and education sector. No clear guidelines from DoT will jeopardise many of these businesses.

In addition to this, the Ministry of Electronics and Information Technology is in the process of developing a new data center policy. This policy will set the framework for structural and regulatory interventions. It is expected to be in-line to the proposed data privacy and security laws of the country which focuses on domestic data storage. A CCSP can keep an eye on this space and make decisions concerning investment and regulatory requirements for development of data center facility in India.

Omni-channel technologies have become a sought-after trend in recent times and with the new guidelines, the market for contact center service providers will continue to expand.

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Gaurav Ahluwalia
Managing Director, R&M India

"Cloud, edge and 5G will dominate infrastructure development"

R&M (Reichle & De-Massari Holding AG) is a global producer of future-proof products and systems for communication and data networks. It has been collaborating closely with certified partners to offer innovating solutions in LAN, public and telecom networks as well as data centers. The two-person company set up in 1964 to develop and produce simpler to install telephone outlet has over the years expanded to covers a vast range of develops connecting technologies for communication networks including fiber optic distributors, patch panels and computer connection modules. The company's India Managing Director ***Gaurav Ahluwalia*** *in an interview with* ***Anusha Ashwin*** *talks about the trends in networking, infrastructure management, cabling and cloud. Excerpts:*

The pandemic has led to a surge in data usage in turn to a growth and demand of data centers. How is R&M addressing the market needs?

Digital age has prepared data centers (DCs) to cope with the surge in the demand as well as any problems thrown against them including the pandemic. The industry has a long history of experience operating in difficult circumstances and environments and it has prepared the DCs to play this key role as the backstop for the rest of the economy. Data traffic continues to grow exponentially, boosted by the internet of things (IoT), 5G, intelligent transport systems, and an ever-increasing number of wireless connections. R&M knows that an optimized data center network is a mission-critical component of a business-oriented IT infrastructure strategy. Our Netscale family offers the industry's highest 19-inch cabinet fiber port density. The new fiber optic distribution platform Netscale 72 natively supports Base8 and Base12 parallel optical cabling and offers RFID-based automated port documentation and visual guidance of work orders.

Our inteliPhy net infrastructure management software provides an easy-to-use DCIM solution for asset, capacity and change management. inteliPhy net can also help plan and control migrations, workflows, maintenance as well as patch jobs, and allows network managers to show they're utilizing resources and satisfying quality, compliance and service requirements.

> While the trend towards complex large-scale projects and high performance persists, the relatively new category of edge data centers is also gaining importance.

> We need to set the course for edge computing now in order to build the necessary infrastructure for the coming decades.

We at R&M want to differentiate through two USPs – smart networks and customer journey excellence. We serve the Indian market specifically both with our Smart Networks solutions which help to bring automation and efficiency into the connectivity infrastructure and are already deployed at many Indian banks. At the same time, our production plant in Bangalore guarantees short lead times and flexibility to respond to our customers arising needs.

How has the cloud landscape impacted DCs?

Data centers are at the heart of many businesses. Providers are continuing to invest heavily in hyperscale and co-location DCs, as well as in IT equipment and cabling. While this trend towards complex large-scale projects and high performance persists, the relatively new category of edge data centers is also gaining importance. When huge volumes of data need to be processed without latency, the transmission path to a central hyperscale data center is often too long and too expensive. Edge computing will, therefore, be the next big thing on the path to the digitization of society and the economy.

We, therefore, need to set the course for edge computing now in order to build the necessary infrastructure for the coming decades. The cloud, edge, and 5G together will dominate infrastructure development in the future. There will not be a sharp distinction between the cloud and edge, but rather the two systems will complement and support each other.

Security has been a major concern since the world was hit by the pandemic, how is R&M tackling the growing security concerns and disaster recovery in DCs?

Enterprises depend on multiple layer defence to protect DCs from external security breaches. Industry-standard firewalls and access control lists are mostly used to enforce network segregation. Logs are routinely examined to reveal any exploitation of programming errors. Access to networked devices is restricted to authorized personnel all the while securing data in transit, at rest and on backup media. Encryption is an important piece of security strategy, helping to protect emails, chats and other data.

Organizations can also deploy artificial intelligence (AI) in the data center for data security. Data centers must identify and asses all mission critical assets and risks. Once they have been identified it will be far easier to formulate a business continuity plan with specific goals in mind. Server load balancing and link load balancing are two strategies that may be used to help prevent the loss of data from an overload or outage in a data center.

What are the innovations that you are bringing to the market?

Netscale Fiber Cabling is high-density multi-stranded cable, which form the backbone of the data center. The Netscale range from R&M offers the highest density of FO ports in 19-inch cabinets in the industry. The new fiber optic distribution platform Netscale 72 combines unmatched fiber cable management with automated connectivity tracking and an innovative tray design to deliver the world's highest port density for 10/40/100G Ethernet. With inteliPhy net, R&M is offering an easy-to-operate DCIM solution for asset, capacity and change management

R&M's optimal optical raceway and cable management designs – cabinets with integrated vertical and horizontal cable management – provide enhanced handling and more space for airflow; raceway design services already envision future moves, adds and changes.

We provide bandwidth-explosion-ready High-Performance Network Connectivity (HPNC) – best of breed OM5 optical fiber, Cat 8A twisted-pair and SFP+ direct attach technology meet the bandwidth requirements of upcoming Ethernet and Fibre Channel applications.

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Indian telcos want to live an edge-y life

Online gaming, connected vehicles, and remote working environments require an unprecedented level of low-latency networks

BY VIKRAM ANAND

Imagine that you're sitting in the middle of an important client presentation and your high-speed internet connection fails. You're watching a cricket match that's in the final minutes and suddenly the live stream freezes and all you hear is cheering sound from your neighbor. Your parents require surgery but can't travel to a hospital in a large city for treatment, so they must have remote surgery. These are some real-life situations that you might have faced, as our dependency on the internet and connectivity services reaches the next level due to the current mandates requiring us to remotely work and play.

For Indian telcos who already offer the world's cheapest data rates, it's very difficult to maintain revenue growth of connectivity services. This will become even more challenging with the inevitable shift to 5G. In order to support the surging demand for high-bandwidth and low-latency applications in our remote environment, telcos can consider taking a new approach to transforming their network architectures – it's referred to as edge cloud.

Our low-latency world

The need for speed is reaching all new levels and network reliability will become non-negotiable. For example, take smart factories or online gaming championships. Even a small lag in the network can cost you your production cycles or the big prize money you were about to win in the online game.

Low-latency use-cases span a variety of industries including education, retail, agriculture, banking, healthcare, and entertainment. For example, digital

> The distributed approach of edge cloud is an opportunity for telcos, as they control the last-mile network closest to end-users, both humans and machines.

experiences that require low latency include students using cloud-based tools for virtual education, shoppers tapping into virtual reality to "experience" a piece of furniture in their home before purchasing it, accurately managing sensors in gas facilities, or improving soil productivity for farmers.

Transforming networks to keep up

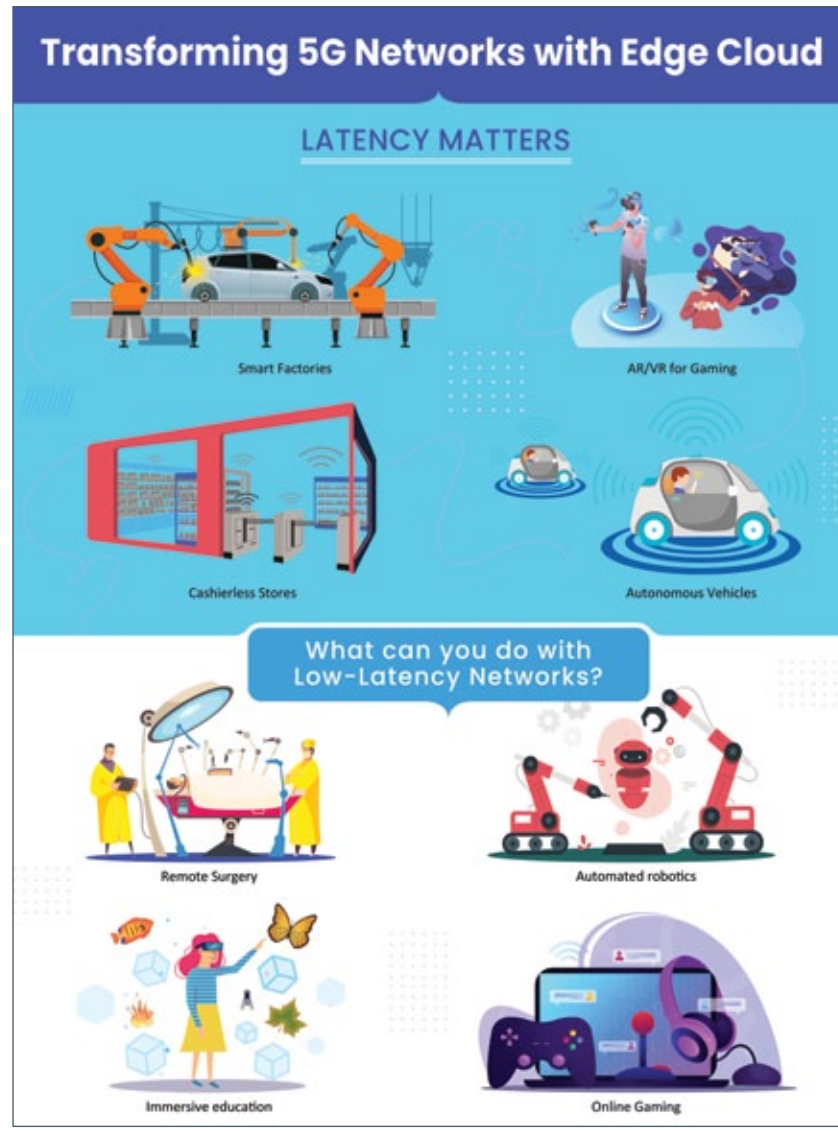
These new-age cloud-native applications are set to be highly sensitive to latency requirements, as well as compute needs. This is where traditional centralized data center models can struggle to deliver. The quality of experience requirements is of a different magnitude altogether.

The distributed approach of edge cloud is an opportunity for telcos, as they control the last-mile network closest to end-users, both humans and machines. This framework is a network of several edge- compute data centers closer to end-users. These provide faster processing of information to ensure an overall superior quality of service. The shift will result in a 5x increase in the number of data centers and promises to completely transform network architectures so telcos can continue to deliver the digital experiences their end-users need today.

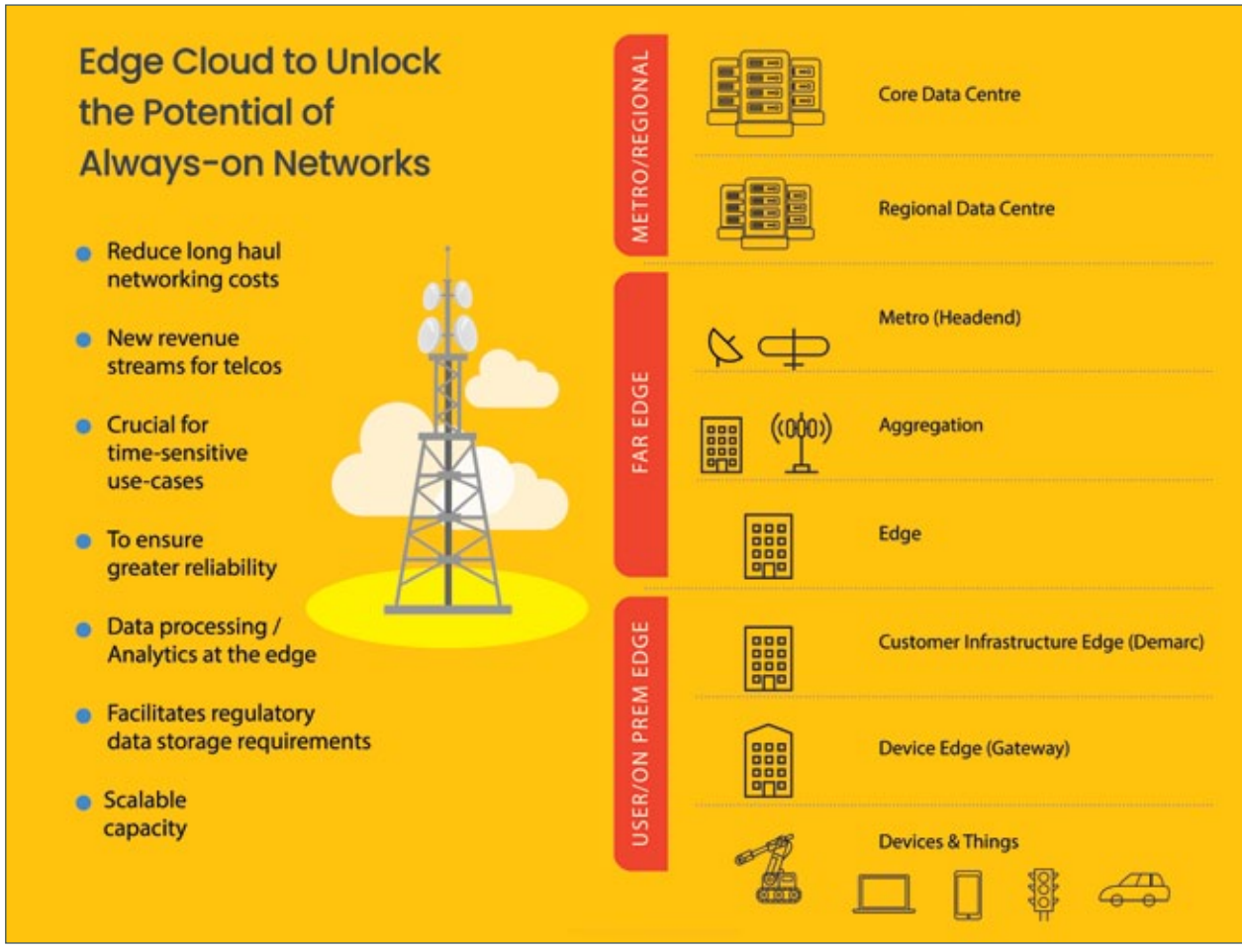
Edge computing is driving the need for the distributed cloud and cloudification of the telecommunications network from the core of the network to the edge.

Edge cloud ushers in 5G

Telcos can leverage edge cloud to not only deploy future network functions such as cloud-native network applications, but also to create new service offerings. The aim is to ensure that data gets aggregated and analyzed as close as possible to where it's both created and consumed. Edge cloud provides near-real time cloud computing capability being closer to consumers or enterprises, strongly coupled with an IT environment at the network edge, offering a platform to support many of the low latency use-cases enabled by 5G. Cost-effective 5G service delivery is not possible without edge cloud, as 5G is not simply a faster version of 4G. Most 5G deployments will be increasingly virtualized, decentralized, and driven by intelligent automation.



Adopting edge cloud is not without challenges. If deployed wrongly, it can turn out to be very expensive and complex alongside security-related challenges.



Telcos can monetize their networks by offering the ability to dynamically allocate different cloud and network resources to meet specific Service Level Agreements (SLAs) for each service within and across their edge data center and network infrastructure. This provides for supporting 5G network slicing, which allows operators to provide multiple simultaneous and differentiated services using common physical infrastructure.

As expected, adopting edge cloud is not without some challenges. If not deployed correctly, edge cloud can turn out to be very expensive and complex alongside security-related challenges. Telcos are also likely to see competition from hyperscale cloud providers and data center operators. Though the Indian telcos are well-placed to leverage the edge cloud opportunity, due to their dominance in their access network real-estate, they should have a collaborative model to work with others in the ecosystem.

As Indian telcos continue to support today's remote environment, edge cloud will play a pivotal role in reducing latency and providing a platform for the next era of digital innovation. Looking ahead to 2021, edge cloud can transform networks for India's telcos and become the new core of their revenue growth models.

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Harsha Solanki
Managing Director, Infobip

"We seek to become the AWS for B2B and B2C communication"

Infobip operates a full-stack Communications Platform as a Service (CPaaS) with private cloud infrastructure and zero-hop connectivity to telecoms globally. As the company Managing Director ***Harsha Solanki*** *has quadrupled the turnover of the enterprise in the last four years and is working towards building Infobip as an engineering mitochondrion with its benchmark-defining CPaaS infrastructure and an innovation-centric perspective. In an interaction with* ***Shubhendu Parth,*** *she talks about the business communication trends, the evolving CPaaS market, and how organizations are adopting omnichannel solution to strengthen customer engagement in the New Normal. Excerpts:*

The work and life in the new normal seems heavily dependent on digital communication technologies. What has been the learning from the pandemic and how is the business communications and messaging sector evolving?

The pandemic has enabled a paradigm shift in the way businesses operate. Digital has now become a fundamental part of an organizational structure. In fact, in the wake of the rise of remote working and study-from-home culture, the reliance of individuals on digital technology has also reached a point of inflection, reversing which is no longer possible. Today, customers are using a range of devices and formats to tap into the digital ecosystem and stay connected to the modern world. However, this doesn't mean that things have remained unchanged because of digital interventions. If anything, it is common knowledge, validated by personal experiences that individuals are struggling to maintain bonds with their acquaintances, friends and family, in the absence of physical interactions, especially when the loss of physical intimacy occurs for long stretches, as has happened to most of us during the initial lockdowns.

The pandemic, therefore, has highlighted the need for brands to be mindful of the basic elements of human interaction. If, as a brand, you need to reach out to your customer, you need to recognize the value of human interaction and empathize with people. Engagement today cannot be focused solely on driving numbers; it needs to deliver value in order to become successful. This is where personalization enters the picture. One of our main lessons from the pandemic is that if you try to translate a square message and force it to pass through a triangular channel, the effort is not going to yield any result. In the post-COVID-19 world, even more so than before, personalizing each instance of communication is necessary to maximize engagement and helping the customer connect with the brand of an emotional level. For instance, a brand can personalize its campaign by deploying it on an event-specific basis, such as the birthday or anniversary of the target customer. This is

> Brands can create automated, multi-step customer journeys across channels while monitoring results at every step of the communication flow and setting up goals."

precisely what we aim to do by empowering enterprises to seamlessly manage the brand experience across an array of channels.

We believe that brands need to understand what customer need, when they need it, and why they need it. Consequently, we are committed to simplifying the complexity of global messaging for our clients, enabling them to effortlessly reach their customers in a personalized manner, while complying with all local regulations.

And which are the hottest sectors? Where do you see the maximum demand coming from?

We are operating in the communications platform-as-a-service (CPaaS) market which has been around since 2008. Over the years, it has continued to add new capabilities, including an expanded base of cloud communication channels, as well as packaged modules that perform a specific task like conversational messaging or user authentication. The pandemic has caused the need-gap in this space to widen and leading players are rising to the occasion to resolve them. Take the example of the need for companies to safeguard the privacy and professionalism of remote workers, something that has become an urgent requirement in the increasingly digital-first world of today.

Leading CPaaS players are addressing this need through number masking solutions. In this case, CPaaS enables us to tie it up with a company's PBX and manage it as one system. Infobip's client portfolio also includes companies across sectors such as retail, banking, and on-demand service, among others. One thing is common to all: everybody working towards their 'engagement' goals. Brands are also looking to fine-tune their campaign engagement and monitor results at every step of the communication flow. As the demand for superior communication solutions continues to mature, we anticipate higher adoption of our solution by marketing and sales departments across industries.

Infobip recently launched the omnichannel customer engagement hub Moments. Is it a communication solutions or business analytics tool?

We are focused on empowering businesses to bolster their communication strategies. To achieve this, we leverage elements of business analytics to gather insights from the data lake to sharpen the edge of our communication solutions. This is necessary because the digital lines are blurring faster than one can think and modern-day customers are logging into multiple channels and social media platforms including WhatsApp, Facebook Messenger, Viber, etc. to express their digital identity and connect with their peers.

Against this backdrop, only those businesses that are available across all channels, are collating a diverse range of data, and using granular data-mined insights will be equipped to accurately identify the nitty-gritty of their customer bases and how best to engage with them through effective marketing campaigns. This is where 'Moments' steps into the picture. Today, it is no longer an option but a critical business imperative for brands to adopt a robust omnichannel strategy to create meaningful relationships with their customers by delivering personalized experiences. By using our customer engagement solution Moments, which uses AI-based automation and powerful analytics to provide a 360-degree view of every customer segment, new-age businesses can deliver the right set of messages to the right customer at the right time over the right communication channel.

So, how exactly does the omnichannel solution help a brand engage with customers or market respective products?

As mentioned above, brands are collecting customer

> We are anticipating the conversational user interface – with people comfortably talking to bots – to become the platform of choice for developers, surpassing mobile-first and cloud-native projects.

data from across multiple channels based on their engagement with the customer. To analyze this massive set of data and use insights derived from it, brands need an omnichannel customer engagement solution that can enable them to get a richer understanding of the different needs and sensibilities of each customer segment. Doing so, brands can create automated, multi-step customer journeys across various channels while monitoring results at every step of the communication flow and setting up goals, tracking engagements, conversions, downloads, etc. This allows brands to design personalized engagement strategies to target each customer segment with while fine-tuning the campaign strategy as and when required, armed with the understanding of which message would work better in a particular context and what is the best time to deploy. By doing this, brands can maximize the success rate of their marketing campaigns and drive conversion and loyalty at speed and scale.

What technologies are driving the business communication sector and how do you see 5G impacting it in the days to come?

While the world is moving towards 5G adoption its uptake in India will be relatively slower. However, businesses need to be prepared to tap into its power whenever the fifth generation of cellular technology makes its entry into the Indian market. 5G has the potential to optimize the connectivity solution on the back of its lightning-fast download and upload speeds, low latency, and improved response rates. India's digital ecosystem will quickly adapt to the disruption led by 5G with people using 5G compatible devices. When that happens, brands will need to up the ante of their communication infrastructure to accommodate higher traffic and accelerate their response time. 5G will also drive innovation because it will encourage businesses to invest and try out new services.

And where do players like Infobip fit in this scenario where organizations are trying to recover from the impact of the pandemic in the post-lockdown world?

Business communication has evolved rapidly since the COVID-19 outbreak. Customers have adopted a digital-first approach with open arms. They are now present across all channels and engaging with brands through social media and messenger apps, in addition to established communication channels such as brand website, customer support IVRs, emails, etc. This behavior has become entrenched and way past the point of inflection. In a sense, there is no going back to the old way of doing things – especially when it comes to brand-consumer communication and engagement.

Brands must adapt to this changing paradigm, and soon, if they want to continue to thrive in the post-pandemic era. This, however, is easier said than done. The pace of technological innovation has kept marketers on their toes. Even organizations with dedicated in-house teams and massive marketing budgets often face challenges with identifying and implementing the most relevant tech solutions to drive their customer outreach and engagement strategies.

Infobip steps in here to address these concerns as an integrated, tech-enabled brand communication solutions provider. We leverage cutting-edge solutions, such as 'Moments', to enable brands to quickly create automated, multi-step customer journey flows that are backed by intelligent analysis and data-mined insights. On the other hand, along with our network of partners that includes telecom operators, tech companies, aggregators, social media platforms, and messaging apps, we are creating a robust ecosystem that is attuned to the evolving brand communication needs of the digital age.

> Telcos are facing two related questions in the cloud journey: where to compete versus where to partner. A good tech partner can help untangle this conundrum."

Our holistic approach enables contextual engagement and hyper-personalization in brand communication and is helping brands achieve better business outcomes in line with their short-term and long-term objectives. It is already emerging as a non-negotiable requirement in a world that continues to migrate digitally in the wake of the pandemic.

The company has been actively engaging with mobile operators, banks, social networks, technology companies, messaging apps, and aggregators. How exactly do you help them?

Our various associations and partnerships are meant to tap into the synergies that exist between tech enablers, messaging apps, telecom operators, and aggregators to deliver superlative and personalized brand communication solutions to our clients. For example, banking and e-commerce transactions are increasingly taking place over messaging, social media, and other rich communication services (RCS) channels such as WhatsApp, Telegram, Facebook, and FB Messenger because customers find them convenient.

We help brands leverage these communication channels to reach out to their target audiences where they are most active – at the right time, with the right message, and through the right channel – with innovative marketing automation solution. We help our clientele onboard, engage, and retain customers with targeted campaigns via intelligently automated behavior/event-triggered messaging that is personalized through rich, in-depth profiling and customer segmentation. This blurring of lines between marketing, sales, and customer service streamlines the end-user's journey and enables brands to engage with customers, at speed and scale.

Telcos, for example, are both cloud consumers and providers, with a drive towards cost reduction and revenue increase. As such, they are facing two related questions in the cloud journey: where to compete versus where to partner. A good tech partner can help untangle this conundrum.

We also collaborate with software partners big and small and their partner ecosystems to help build demand, sales planning for partner-to-partner empowered selling and deliver marketplace-led commerce for end-customer transformation. It is more than about creating a wider reseller network or reach a bigger client base or simply bigger clients – rather it's also about providing a more open and integrated arena to power digital customer experience in today's hyperconnected world.

What are your plans for the future?

In line with the growing shift towards an omnichannel mode of engagement, our SaaS portfolio provides modern businesses with relevant solutions including Moments, Conversations, and Answers. These solutions have evolved naturally from customer feedback based on the usage of the web-based interface, which was created back in 2010. We have built our omnichannel engagement solutions portfolio on top of our already strong CPaaS platform. Through our solutions, our goal is to eliminate the silos between customer service, marketing, and other departments, thereby bolstering the communication and engagement strategies of our clients.

The next significant development in the CPaaS market will be marked by the shift to a conversational commerce experience. Hence, we are anticipating the conversational user interface – with people comfortably talking to bots – to become the platform of choice for developers, surpassing mobile-first and cloud-native projects. We are also expecting RCS to become a crucial revenue driver for mobile operators as well as enterprises, with Mobile Identity becoming a universal standard. Against this backdrop, we seek to double-down on innovation and development to become the AWS for B2B and B2C communication, and establish our leadership in the CCaaS and CPaaS industry in the coming years.

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Better safe, than sorry

Real-time app monitoring solutions help enterprises get a single consolidated view of actionable security intelligence and fight against hackers

BY GOVINDRAJ BASATWAR

In January this year, the Ministry of Health and Welfare cautioned people against downloading fake CoWIN (COVID Intelligence Network) apps. The warning came because of a flood of fake apps that were launched on public app stores to capitalize on the restlessness of people to get themselves registered for a vaccine that protects people against the COVID-19 infection. This is not an isolated incident, and there have been countless instances of hackers trying to take advantage of specific situations. From fake contract tracing apps to fake banking apps to fake donation apps – the mobile app marketplace is an attractive target for hackers.

With smartphone usage booming, and an app available for almost every function, apps represent a huge opportunity for hackers. In the COVID-19 era, demand for mobile app development has gone through

> Runtime application self-protection can help enterprises deal with runtime attacks by constantly intercepting calls to the application to check their security.

> Hackers reverse engineer apps to understand how the application works, the encryption used and also to find out potential vulnerabilities.

the roof, as every enterprise wants to create an app. With demand being high, and developers being asked to develop apps in the shortest possible time, security has not received the attention it should. Most app developers have not incorporated the standard security processes, which make their mobile apps extremely vulnerable to security concerns. If security is not incorporated as part of design for app development, apps are under threat from hackers for code theft, reverse engineering, malware insertion, information leakage, and hacking attempts at runtime.

Globally, and in India too, there have been countless examples of apps being hacked or modified or cloned. These apps may contain malware and can impact the reputation of the original app maker. It is also common to see apps being reverse engineered and repackaged and re-posted as a completely different app. Hackers also reverse engineer apps to understand how the application works, the encryption used and also to find out potential vulnerabilities. This leads to loss of revenue, loss of intellectual property and also erodes the hard work of developers who have spent months or years in developing the app. Malicious code insertion is another serious risk. Many mobile apps do not restrict the type and number of characters that users can input in a form. This enables hackers to inject Javascript into the login form, and gain access to the app.

Why real time protection is important?

To protect apps, there is a critical need of a solution that protects apps against runtime attacks by providing insights into hidden vulnerabilities. This approach is needed because app security is dependent on multiple components related to networks, operating systems, and databases. An innovative approach called RASP (Runtime application self-protection) can help enterprises deal with runtime attacks by constantly intercepting calls to the application to check their security.

As RASP can be embedded within the application, it protects apps against unknown or zero day threats without any human intervention. Given the varied nature of infrastructure and related components and the diversity in attacks, RASP is a must-have solution today for ensuring mobile app security. RASP can not only be used to monitor vulnerabilities, but also be programmed to take actions such as terminating user sessions or analyzing traffic at runtime.

This real time protection enabled by RASP can ensure the following.

- Proactive security and protection against zero day or unknown attacks which make them more effective than traditional solutions.
- Offers real-time protection against common attacks such as attempt to reverse engineer or tamper code, unauthenticated data leakage or network sniffing.
- Significant reduction in false positives as the solution is embedded within the application.
- Agnostic to the source of the attack which is extremely critical in the way security threats have evolved.
- In-built incident logging and response solution which helps in understanding the root cause of vulnerabilities.
- No impact on performance of app.

In summary, real-time app monitoring solutions help enterprises get a single consolidated view of actionable security intelligence to improve security posture and reduce risks. With the scale and complexity of attacks increasing day by day, a real-time app monitoring solution can be a valuable in the fight against hackers!

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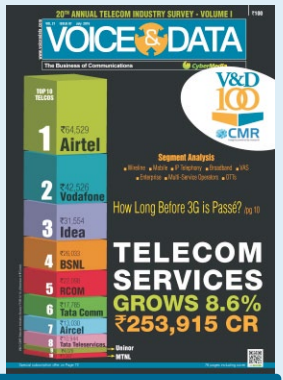

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Pandemic-hit smartphone market to pick up sales in 2021

The lockdown may have led to the first-ever drop in several years, the demand for devices picked up as India started to work from home in the new normal

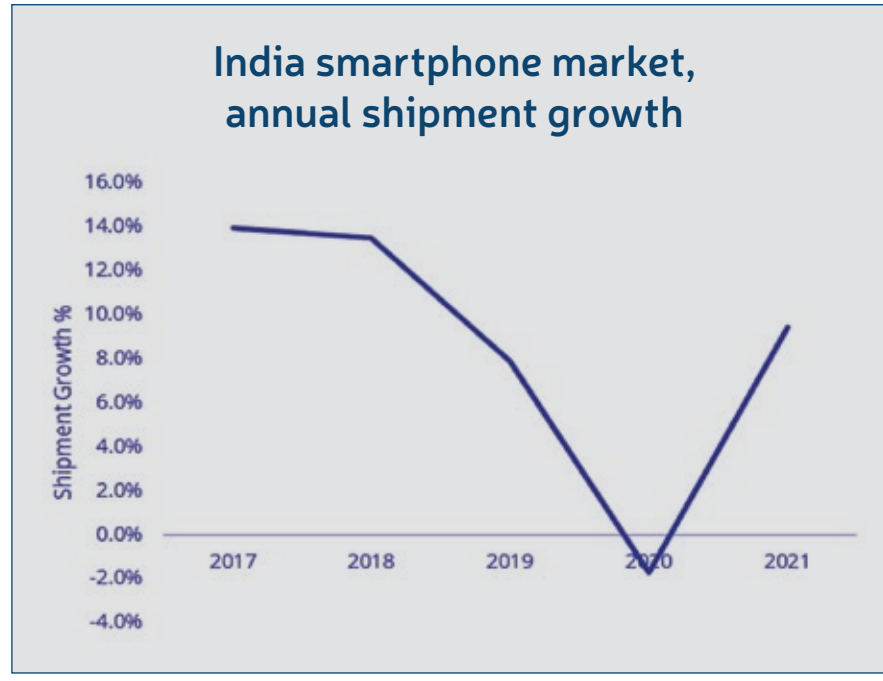
V&D BUREAU

The smartphone market in India registered a 2% year-on-year (YoY) decline in 2020, first time after several years of strong growth. According to International Data Corporation's (IDC) Quarterly Mobile Phone Tracker, the India smartphone market exited 2020 at 150 million units, a 1.7% YoY decline, after several years of growth. "Stay-at-home mandates, remote work, remote education, travel restrictions, and manufacturing shutdowns led to a sluggish H1'20 (-26% YoY decline), particularly impacting 2Q20," IDC stated.

The report, however, indicates that the sector recovered in H2'20 with 19% YoY growth, as markets reopened gradually. Lockdowns and restrictions rendered an urgent need for devices supporting activities such as entertainment, work from home, and remote learning, resulting in more devices per household, and leading to resurgence in demand for consumer devices including smartphones, consumer notebooks, and tablets in 2020.

The sector, recovered in 4Q20 (October-December) posting a record shipments of 45 million devices, with 21% YoY growth. While smartphone shipments for the full year 2020 remained below the pre-pandemic level, IDC believes that strong market acceleration in 2021 will be led by upgraders.

"The rebound of the smartphone market in the latter half of 2020 underscores the importance of devices in our day-to-day lives. In 2021, IDC expects the smartphone market to grow in high single-digit YoY, driven majorly by upgrading consumers, in the mid-range segment and affordable 5G offerings (~US$250). Also, revamped offline channel play is anticipated, to bring back growth in the very important brick and mortar counters for long term sustainability," IDC India Research Director for Client Devices & IPDS Navkendar Singh said.



Source: IDC, 2021
*Note: *The "2021" represents preliminary forecasted figure for shipment growth in CY2021*

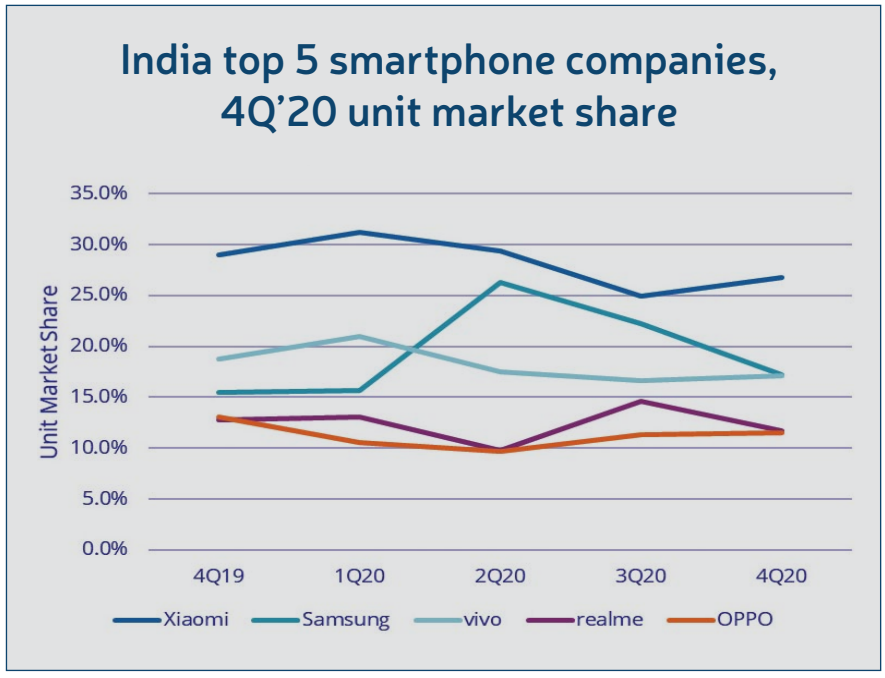
The smartphone market will grow in high single-digit, driven majorly by upgrading consumers, in the mid-range segment and affordable 5G offerings (~US$250).

Key market trends for 2020

The online channel outpaced the overall market, growing by 12% annually with a 48% market share in 2020. Multiple sales events, promotions, trade-in/upgrade programs, and affordability initiatives helped it in clocking a record 51% share in 4Q20. However, in the pre-Diwali weeks of October and November, retail footfall gradually picked up the pace, as the offline channel registered 5% YoY growth in 4Q20.

MediaTek processor-based smartphone shipments led with a share of 43%, closely followed by Qualcomm at 40% in 2020. MediaTek expanded its lead in the <US$200 price segments.

5G smartphone shipments crossed 3 million in 2020, with Chinese OEMs rolling out aggressively-priced devices through 2020, including Xiaomi's Mi 10i at a <US$250 price point. But adoption was limited by higher prices and the lack of a 5G network, which is expected to start to roll out in late 2021 or early 2022.



Source: IDC, 2021
*Note: *The "2021" represents preliminary forecasted figure for shipment growth in CY2021*

Added IDC India Associate Research Manager, Client Devices Upasana Joshi: "As more 5G devices enter in 2021, the ASP for smartphones is expected to rise. IDC expects vendors to launch 5G devices at multiple price points backed by aggressive promotions, as 5G currently remains a novelty rather than a necessity to most."

Top 5 smartphone vendors

Xiaomi's performance in 2020 was led by its affordable Redmi 8 series, gradually replaced by the Redmi 9 series in H2'20. Though it continued to face supply shortages through H2'20, resulting in an annual decline, Xiaomi maintained its leadership in 2020. POCO, Xiaomi's sub-brand, entered the "top 5 online channel vendor list", strengthening Xiaomi's online position at 39% share in 2020.

> IDC expects vendors to launch 5G devices at multiple price points backed by aggressive promotions, as 5G currently remains a novelty rather than a necessity to most.

India smartphone market: Top 5 companies (shipments in million, market share, YoY growth, 2020

Company	2020Q4 Shipment Volumes	2020Q4 Market Share	2020Q4 YoY Growth	2020 Shipment Volumes	2020 Market Share	2020 YoY Growth
1. Xiaomi	12.0	27%	12%	41.0	27%	-6%
2. Samsung	7.7	17%	35%	29.7	20%	-4%
3. Vivo	7.6	17%	10%	26.7	18%	12%
4. Realme	5.2	12%	11%	19.2	13%	19%
5. OPPO	5.1	11%	7%	16.5	11%	1%
Others	7.2	16%	75%	16.6	11%	-23%
Total	**44.8**	**100%**	**21%**	**149.7**	**100%**	**-2%**

Source: IDC Quarterly Mobile Phone Tracker, February 2021

*Note: *The "Company" represents the current parent company (or holding company) for all brands owned and operated as subsidiary.*

**Figures in tables/charts rounded to first decimal point*

Samsung remained in its second spot in the 2020 ranking, with its online-heavy portfolio driven by the Galaxy M series and the newly launched F series. Online channel registered strong 65% YoY growth, while the offline channel shipments declined by 28%, thus leading to an overall drop of 4% in 2020.

Vivo stood at the third position, with strong growth in the offline channel, dethroning Samsung for the leadership position in the offline channel with 30% share, driven by the affordable Y series and dedicated efforts in marketing and promotional activities in offline channels.

Realme surpassed OPPO for the fourth slot with 19 million annual shipments, growing by 19% YoY in 2020. It continued to be the second-largest online vendor, with its affordable C-series as a major driver. OPPO's annual growth remained flat YoY in 2020, while it maintained a focus on the offline channels, and regained its third slot ahead of Xiaomi with an 18% annual share driven by the affordable A series.

Among others, Transsion (ranked sixth) accounted for an impressive 64% annual growth in 2020, driven by its online-exclusive Infinix portfolio and its Itel and Tecno-branded phones widely available in smaller towns and rural areas. Apple, at the seventh slot, exited 2020 with YoY growth of 93%, driven by previous generation products like the iPhone 11, iPhone SE (2020), and iPhone XR, even as the new iPhone 12 series had a strong pickup in 4Q20.

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India unveils PLI scheme for telecom equipment makers

The initiative is likely to generate 40,000 direct and indirect job opportunities and tax revenue of Rs 17,000 crore from telecom equipment manufacturing

V&D BUREAU

Following the success of its production linked incentive (PLI)-scheme for the mobile and component manufacturing, the Government of India has approved the PLI scheme for telecom and networking products with an outlay of Rs 12,195-crore over five years. Announcing this after the Union Cabinet meeting, Communications Minister Ravi Shankar Prasad said that the move will help improve ease of doing business in the country. He also noted that the PLI scheme will position India as a hub of global supplier of telecom equipment.

"The scheme is aimed at offsetting the huge import of telecom equipment worth more than Rs 50,000 crore and reinforce it with Made in India products both for domestic markets and exports," the minister said. The government had, in November 2020 rolled out the PLI scheme for large-scale electronic goods makers for five years, and has so far attracted Rs 34,000-crore investment from some of the top mobile companies.

The implementation of the PLI scheme will start from April 2021. According to Prasad, while the PLI scheme is primarily aimed to cut import dependence, it will encourage domestic telecom infra makers as well and generate more than 40,000 direct and indirect employment opportunities and generate tax revenue of Rs 17,000 crore from telecom equipment manufacturing, including core transmission equipment, 4G/5G radio access network and wireless equipment, access and customer premises equipment, internet of things access devices, other wireless equipment and enterprise equipment such as switches and routers.

The minimum investment threshold needs to be at least Rs 100 crore for large industries and Rs 10 crore for MSMEs. The Incentive will be 1% higher for MSMEs to promote healthy competition and can reach up to 20 times the amount of investment at the start to realize their full potential, a PIB release from the ministry stated.

"Support under the Scheme will be provided to companies/entities engaged in manufacturing of specified telecom and networking products in India. Eligibility will be further subject to achievement of a minimum threshold of cumulative incremental investment over a period of four years and incremental sales of manufactured goods net of taxes (as distinct from traded goods) over the base year 2019-2020. The cumulative investment can be made at one go, subject to annual cumulative threshold as prescribed for four years being met," the release stated.

The telecom and networking products exports market worldwide stands at USD 100 billion and the Government of India is looking at augmenting the country's capacity by attracting large investments from global players and at the same time encourage promising domestic champion companies to seize the emerging opportunities and become big players in the export market.

"With this scheme, India will be well positioned as a global hub for manufacturing of telecom and networking products. Incremental production around Rs 2 lakh crore is expected to be achieved over five years. India will improve its competitiveness in manufacturing with increased value addition," the release said, adding that PLI is likely to bring more than Rs 3,000-crore investment and generate huge direct and indirect employments in the country.

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In-cabin sensing radar to help improve passenger safety

The 60GHz single radar solution can detect presence and vital signs of occupants and send emergency alerts if its detects any abnormality

V&D BUREAU

Bitsensing, South Korean imaging radar technology startup, has announced that it has designed a safety monitoring solution that can detect in-car passenger presence and location, and send alerts if there are any abnormalities. The 60GHz single radar solution MOD620 can also detect in real-time the presence of a child left in a car, even when the car is shut down and locked.

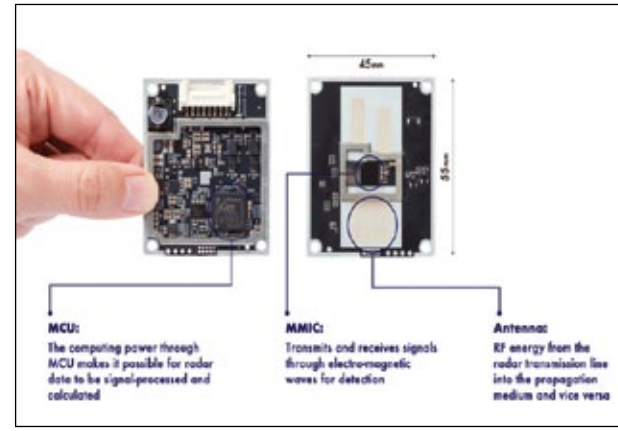
According to research, the reason for 54% of child death in hot cars since 1990s was because they were forgotten by their caregivers. "The MOD620 prevents such casualties by efficiently detecting the presence and vital signs including heartbeat and respiration rate of occupants and sending the driver alerts if a child is left unattended inside a car," a company press release said, adding that the solution has been built on Infineon Technologies chipset.

The Driver Monitor System (DMS) radar sensor also recognizes gestures of the driver to detect drowsiness and can send distraction warnings or offer post-crash monitoring. The MOD620 can also be used to identify if passengers are left unattended in emergencies such as car crashes.

To build the in-cabin sensing radar, Bitsensing rearranged the hardware configuration and redesigned the antenna. "Powerful computing is achieved through the MCU making it possible for radar data to be signal-processed and calculated. The MMIC transmits and receives signals through electro-magnetic waves for detection while the antenna is integrated with RF energy from the radar transmission line into the propagation medium and vice versa. These components work together seamlessly for an advanced caliber of radar performance," the company stated.

Limitless detection, customizable antenna design

The in-cabin sensing radar captures all rear-seat space


MCU:
The computing power through MCU makes it possible for radar data to be signal-processed and calculated
MMIC:
Transmits and receives signals through electro-magnetic waves for detection
Antenna:
RF energy from the radar transmission line into the propagation medium and vice versa

maintaining the top quality for in-cabin solutions. The 120-degree field of view combined with the customizable detection range up to 2.5 meter provides an increased level of performance. The company claims that it has also addressed the privacy concerns as MOD620 does not rely on cameras for presence detection. Besides, the rearrangeable antenna in the MOD620 allows customization in channel length compensation, field of view, and matching circuits for transmitters and receivers.

"Bitsensing's unique expertise in customizable antenna design allows for a quick and efficient process in matching specific in-cabin requirements for any vehicle. The MOD620 is customizable and cost-efficient radar that works in high-speed cars, day or night, with no interference to seatbelts."

The company also stated that its in-house specialists partnered with various labs from top universities to obtain the most accurate data to produce this radar that can accurately detect. The MOD620 offers a safe monitoring solution that is necessary for the optimal autonomous driving experience.

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- Business Continuity Planning Series
- Dataquest Digital Indexing
- DeepTech (India's largest Virtual Conference)

PCQUEST
- Secure Smart & Intelligent Network
- App Modernisation
- Collaboration in WFH environment
- DevOps
- CyberMedia Labs Product Review

CIOL
- CXO of the Week
- CiOL Live Video Series
- Start-Up Circle
- CiOL Cloud Burst
- CiOL Live Tech News

VOICE&DATA
- Business After Covid
- TLF Dialogue Series
- 25 Years of Mobile Telephony India

DQ Channels
- Are There any Make in India IT Products for Us to Use?
- Cloud Adoption in Digital World
- Govt to Harness IT to Empower MSME Sector

and many more....

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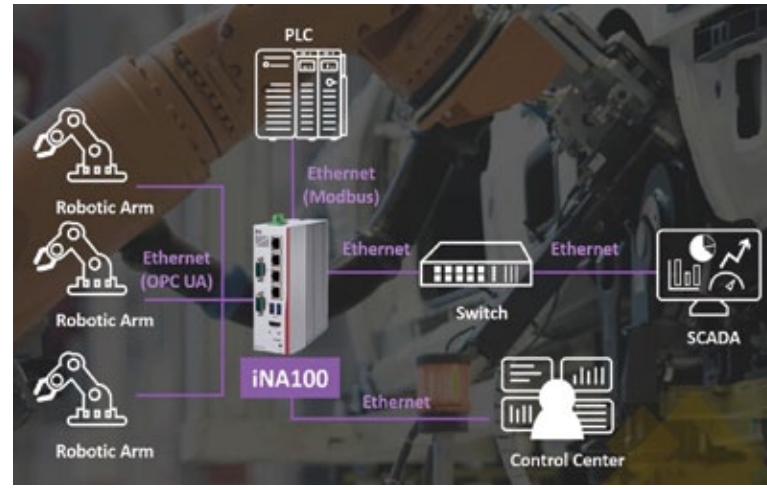
Axiomtek unveils industrial-grade network appliance platform

Axiomtek has announced the launch of iNA100, a DIN-rail industrial-grade network appliance designed for industrial IoT security applications. The iNA100 is powered by the Intel Atom processor x5-E3930 (Apollo Lake) and has one DDR3L-1866 SO-DIMM slot for up to 8GB of non-ECC/ECC memory. In addition, this fanless IIoT edge computing platform has four 10/100/1000 Mbps LAN ports, sufficient storage and high expandability making it suitable for use in industrial cybersecurity, critical infrastructure protection and other OT security fields.



"Security is the most important key to the transformation of Industry 4.0. More devices within OT systems are being connected to IT systems and networks. While this convergence drives significant efficiency improvements, it also exposes OT environments to more cyber-attacks. Axiomtek's iNA100 is created especially for cybersecurity applications. It supports various forms of internet and SCADA connections, including Ethernet, Wi-Fi, 3G/LTE, and serials," Axiomtek's Network Computing Platform Division Product Manager Gordon Cho said, adding that iNA100 is built to withstand harsh operating environments with a wide operating temperature range of -20°C to 60°C and vibration endurance for up to 2 Grms.

The iNA100 aims to fulfill system integrators' needs and meets the changing demands of diverse industrial IoT applications. It has one mSATA (occupied 1 x PCI Express Mini Card slot) one 2.5-inch SATA drive (9.5 mm height) for storage. It also supports one PCI Express Mini Card slot for wireless modules. Its I/O options include two DB9 serial ports, 4 GbE ports, two USB 3.0 ports, one HDMI and two tact switches. Besides, the DIN-rail network appliance platform runs well with Windows 10 and Linux operating systems. It also supports Trusted Platform Module 2.0 (TPM 2.0) to securely store critical data.

IIC launches supply network test-drive program

The Industrial Internet Consortium (IIC), a global organization dedicated to accelerating use of the Industrial Internet of Things (IIoT), has launched a new simulation solution for supply network optimization. The Supply Network Dynamic Simulation Test Drive enables rapid-engagement pilots for technology users to employ and adopt Industrial Internet of Things (IIoT) technologies.

Through simulations, the test drive enables supply chain leaders to perform network design and optimization models to evaluate risks and countermeasures before deployment in the real world. The program fosters collaboration with partners to address leading-edge IIoT use cases in 3-6-month projects based upon technology end users' real problems. Developed by Advanced Remanufacturing and Technology Centre, a unit of Singapore's Agency for Science, Technology and Research, the solution helps manufacturers optimize supply network design to minimize disruption in supply and demand.

"They can identify distribution centers to best serve customers and verify the savings in transportation and warehouse costs of the new center. Manufacturers can also experiment with 'what-if' scenarios to review the effects of changing inventory policies or sourcing policies in a supply chain," an IIC press release stated.

New standard for open architecture radar interface announced

International technology standards organization Object Management Group (OMG) has announced the Open Architecture Radar Interface Standard (OARIS) 2.0 specification. The standard defines the interface between the combat management system (CMS) and a radar system within the modular combat system architecture of naval platforms.

OARIS 2.0 divides the interface into three categories – subsystem services (interfaces applicable to any module within a combat system), sensor services (interfaces applicable to any sensor component within a combat system), and radar services. The OMG also issued a request for proposal (RFP) for OARIS 3.0 Plot Sharing. OMG is seeking proposals that support a range of networked sensors within fast-moving air and missile targets as well as airborne and subsurface sensors. The enhanced OARIS 3.0 specification will allow for the development, integration, and deployment of technology for much shorter air-defense timelines and more comprehensive air and surface pictures. OARIS 1.0 included a standard approach for radar and general-purpose track reporting between radar and a CMS on one platform.

"Decision makers need help detecting advanced threats much earlier and tracking them more accurately in response to the ever-evolving technological capabilities of future adversaries," Simon Mettrick, Chair of the OMG OARIS 2.0 Finalization Task Force and Openness, and AI Lead Technologist, BAE Systems. "They're looking for a comprehensive air and surface picture that includes 360-degree coverage of the full threat spectrum as well as improved classification with the ability to distinguish various threat types. This information will help decision makers shorten the time from initial target detection to the command of an engagement across sea-, land-, and air-based sensor networks."

Palo Alto Networks strengthens healthcare IoT security

Palo Alto Networks has announced an internet of things (IoT) security solution for healthcare. The solution moves toward securing the internet of medical things (IoMT) through machine learning (ML)-powered visibility, prevention and enforcement, while offering deep insights on healthcare-specific devices and vulnerabilities, the company stated. This helps improve data security and patient safety while meeting the needs of both IT teams and biomedical engineering teams.

While IoT has opened the door for innovative new services across industries, it also presents new cybersecurity risks. This is particularly true in healthcare. "The new IoT security solution uses ML and crowd-sourced telemetry to quickly and accurately profile all devices on the network – even those never seen before. IoT Security also offers ML-powered policy recommendations to reduce manual effort; intrusion prevention to block exploits; sandboxing to detect and prevent IoT malware; and URL and DNS security to stop IoT attacks via the web."

According to a recent report from Unit 42, 83% of medical imaging devices are running on unsupported operating systems, making them potential avenues for attackers. Attacks on medical devices like these can potentially disrupt the quality of care and allow attackers to steal patient data.

Tata Communications offers managed services for Google Cloud

Tata Communications announced that it is partnering with Google Cloud to drive cloud adoption and transform Indian businesses. The partnership will enable organizations to deploy and access Google Cloud services through Tata Communications' IZO Managed Cloud while providing them ease-of-use coupled with end-to-end services, including cloud architecture planning, workload migration and ongoing operational support.

As a Google Cloud India partner, the company will support organizations with services across infrastructure modernization, data centre transformation, application modernization, smart analytics, and multi-cloud deployments, the company stated in a press release.

"The current demands on enterprises to manage and optimize their cloud solutions has never been more important, especially in the wake of COVID-19 and our increasing reliance on cloud infrastructure," Tata Communications Global Head of Cloud and Managed Hosting Services Rajesh Awasthi said. "As organizations migrate to Google Cloud, they need a partner that will support them across their entire IT ecosystem and deliver a unified cloud management platform that offers greater transparency, control and security of their data and applications."

"The true test of 2021 will be how organizations adopt a cloud first approach. Through our partnership with Tata Communications, we will be able to provide our customers with a unified, end-to-end experience that will remove the complexity in cloud management and help them transform at speed and scale", Google Cloud India Head of Partners and Alliances Amitabh Jacob added.

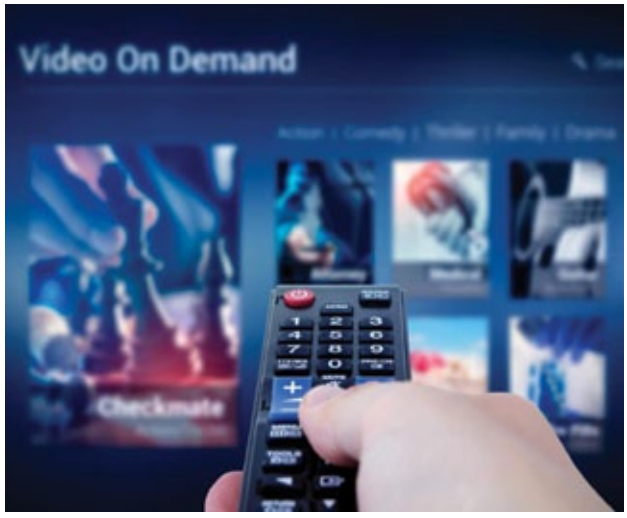
Atlassian launches Cloud Enterprise for large customer needs

Team collaboration and productivity software player Atlassian Corporation has launched Atlassian Cloud Enterprise to meet the needs of its largest customers. "Cloud Enterprise was created to provide improved scalability, security, and governance controls to help standardize Jira Software, Confluence, and Jira Service Management deployments on a purpose-built cloud platform," the company stated in a press release.

More than 95% of new Atlassian customers start with its cloud products. The company has invested in cloud services as the future, to power teams of all sizes now and moving forward. The offering includes five new capabilities to address the 'core needs' of enterprise customers – global scale, with unlimited instances to allow teams to customize instances based on their needs; the highest standards of reliability with a guaranteed 99.95% uptime SLA and dedicated enterprise support; enterprise-grade security and compliance to ensure safe, convenient access to Atlassian cloud products on any device while meeting data privacy requirements across the globe; powerful governance controls for user and change management at scale; marketplace apps that meet enterprise needs for extensibility in the cloud.

Bala Venkatrao, Head of Product, Enterprise Cloud at Atlassian said, "With Cloud Enterprise, we now offer customers the ability to not only standardize on one cloud platform that can scale on demand, but also set up multiple instances to support specific team needs. A key differentiator for this offering is data residency, which is the ability to pin data to a geographic realm."

Vi launches premium video-on-demand service



Indian telecom major Vi has tied up with Hungama Digital Media Entertainment to launch its Pay Per View service model. This is a first-of-its-kind offering by a telco in India's exploding Premium Video On Demand (PVOD) market and enable Vi customers to get access to 380+ movie titles including one of the most talked about film in 2020 by the master film maker Christopher Nolan - "Tenet," in four languages – Hindi, English, Tamil and Telugu.

The PVOD market in India is very premature but promising, as Indian audience continues to be price conscious and choosy. The PVOD models are changing in the new post pandemic era as consumers are looking at alternative options of entertainment in the comfort of their homes. "Vi Movies & TV Pay per view model is a natural extension of our entertainment offerings. The current offerings allow users to watch content at no extra cost as per their recharge or post-paid plans," the company said in a press release.

Commenting on the partnership, Vi CMO Avneesh Khosla said, "With the opening of the economy and entertainment business, new content consumption models are emerging that allow users to watch single content for a specific price. Our innovative and partnership led content strategy has helped us adopt a telco-first approach for content monetization in this hugely untapped market. We look forward to working with like-minded partners like Hungama Digital, to grow this segment."

Movements

OPTIVA BRINGS MATTHEW HALLIGAN AS CTO

Optiva Inc. has announced the appointment of Matthew Halligan as its Chief Technology Officer. Halligan has a proven track record in leading successful engineering teams and has served as an industry thought leader on emerging technologies and their impact on 5G mobility. Previously as CTO of Openwave Mobility, he led the team that developed and launched multiple award-winning, innovative products for many Tier 1 mobile operators worldwide, which helped transform Openwave Mobility into an industry category leader.

Halligan brings to Optiva 28 years of knowledge and experience in developing and delivering highly scalable and reliable quality software products across bare metal, private cloud and public cloud environments. He has also served as CTO of Reviver, a Silicon Valley IoT start-up.

SANDESH KAUP TO HEAD MILESTONE SYSTEMS IN INDIA

Open platform video management company Milestone Systems has brought in Sandesh Kaup as the new Country Manager for India and SAARC. This is the second innings of Kaup in Milestone after four years of successful leadership position at Allied Telesis – a network infrastructure/telecommunications company, involved with secure IP and Ethernet switching solution. Milestone's open platform is currently managing the security and surveillance infrastructure of major airports in India and Metro stations and Smart city Projects.

Kaup comes with over two decades of experience and significant exposure handling multiple global companies. While Milestone has been a part of his DNA since 2011, he has developed expertise in building businesses for companies like Bosch Security, Ingram Micro, and Anixter during his early career.

Ericsson launches new ultra-light Massive MIMO, RAN solutions

Ericsson has announced that it is launching ultra-light Massive MIMO and six RAN Compute solutions to accelerate 5G mid-band rollouts. The new solutions are powered by Ericsson Silicon – the company's system on a chip (SoC) range. The six new RAN Compute products include both indoor and outdoor options for 4G expansions and mid-band 5G rollouts, with up to 50 percent higher throughput and 15 to 20 percent lower energy consumption.

"With new mid-band spectrum available, communications service providers can leverage their 5G spectral assets to roll out services quickly and efficiently to deliver a more responsive experience to mobile broadband subscribers. Mid-band bridges the speed, capacity and coverage gaps between low-band and high-band. 5G networks that harness mid-band spectrum at scale will have the power to provide a full-fledged 5G experience for consumers and enterprises," the company stated.

Ericsson's new line of ultra-lightweight, mid-band Massive MIMO 5G radios from its Antenna-integrated Radio portfolio, is designed to ease mid-band deployment

for service providers. This enables a full-fledged 5G user experience for subscribers, while reducing site footprint and increasing capacity by more than three times. Weighing 20kg, the new radios are up to 45% lighter than the previous generation, and 20% more energy efficient. These radios can be deployed from urban high-rise buildings to suburban and rural capacity areas for use cases, such as Fixed Wireless Access, automotive, transport and logistics.

Nokia wins A1 Austria contract for 5G radio and core

Nokia has bagged a multi-year 5G radio and core contract from A1 Austria to provide comprehensive 5G coverage across the country. The deal, which will support A1 Austria's efforts to be a market leader, will see Nokia supply 5G radio access and core network services. The deployment of products and services is underway with the core element expected to be rolled out in the first half of 2021. "Nokia will supply A1 with its AirScale portfolio including 5G RAN, AirScale base stations, and Nokia AirScale radio access products. These solutions will enable A1 Austria to deliver incredible connectivity and capacity benefits to their consumer and business subscribers," a company press release stated.

A1 will also launch 4G and 5G network slicing commercially following a successful pilot. The solution will support connectivity from 4G and 5G devices over the sliced network to applications running in private and public clouds. The slicing continuity between the networks allows operators to maximize their network

coverage for new mobile connectivity services and deliver new value and business opportunities.

Nokia has a long-standing partnership with A1, including the successful expansion of 3G and 4G mobile networks and the rollout of Austria's largest fiber-optic network. The two companies have also successfully deployed a number of private wireless campus networks in the country, including installations at Magna Steyr, Vienna Airport, and 5G Playground Carinthia.

TechM to support IT transformation of Telefónica Germany

Digital transformation, consulting and business reengineering services and solutions provider Tech Mahindra has bagged a strategic contract from Telefónica Germany to drive their end-to-end IT transformation. Under the project, Tech Mahindra will support Telefónica Germany to deliver faster product launches and provide a more 'human centered' experience to its customers in the mass market segment, the company stated in a press release.

Telefónica Germany had earlier in August 2020 Tech Mahindra to drive its network and services operations, in addition to developing use cases for 5G, artificial intelligence (AI), and machine learning technologies. "This announcement further strengthens Tech Mahindra and Telefónica Germany's two-decade long partnership and reiterates Tech Mahindra's expertise in delivering large scale digital transformation programs."

The company further informed that it will provide a 'digital first' experience by leveraging Out of the Box (OOTB) process libraries and its capabilities across digital technologies like business support systems (BSS), customer experience, cloud, data and analytics, and AI. This multi-year engagement involving modernization of existing stacks based on cloud native products will accelerate Telefónica Germany's digital journey and help achieve its vision to become a digital champion.

Vikram Nair, President, Europe, Middle East and Africa (EMEA) of Tech Mahindra said, "This is a step towards elevating Tech Mahindra's long standing strategic relationship with Telefónica. Through this transformation we will enable Telefónica to 'Run Better, Change faster and Grow Greater'. As a part of the TechMNxt charter, Tech Mahindra is focused on leveraging next generation technologies to cater to our customer's evolving and dynamic needs. We are strongly committed to significantly enhance Telefónica's growth journey and deliver business benefits such as accelerated product launch time."

HFCL launches new range of Wi-Fi 6 products

HFCL has strengthened its IO product portfolio of Wireless Solutions with the roll-out of Wi-Fi 6 products in addition to their existing Wi-Fi 5 Access Points (APs). This new range of IO products by HFCL is targeted to serve global carriers, enterprises and internet service providers to provide seamless data connectivity to their consumers.

The HFCL Wi-Fi 6 products are compatible and complementary to the upcoming 5G technology, offering a seamless integration with 5G core, enabling a smooth mobile data offload implementation for operators thereby providing lower latency, and increased capacity over their predecessors without any hassles of a complex Wi-Fi – 3GPP core integration. "Together they bring next-level, seamless functionality to the wireless world," the company stated adding that the HFCL IO networks new product range consists of Wi-Fi 6 (802.11ax) dual band outdoor and indoor access points.

It also has telco-grade cloud NMS support for comprehensive security features like WPA3, IEEE 802.1X and IEEE 802.11i to ensure higher encryption and secure data transfer of numerous, simultaneously connected devices. The new dual band Wi-Fi 6 Access Points are ideal for dense deployment including large enterprises, office buildings, retail outlets, malls, schools, stadiums, hospitals and many other areas.

Microchip unveils solution for vehicle Ethernet Audio Video Bridging

As connected vehicles increasingly rely on Ethernet for network connectivity, smart technology is helping developers to streamline infotainment system development and quickly adapt to manufacturers' evolving requirements. Microchip Technology Inc. has announced the first hardware-based audio endpoint solution for Audio Video Bridging (AVB) – the LAN9360, a single chip Ethernet controller with embedded protocols.

Microchip's LAN9360 audio endpoint controller interconnects vehicles' infotainment devices including speakers, amplifiers, microphones, navigation systems, radio tuners and smart headrests with Ethernet AVB. "The LAN9360 bridges audio between Ethernet AVB and Inter-IC Sound, Time Division Multiplexing (TDM) and Pulse Density Modulation (PDM) local audio interfaces. It completely supports audio transmission over Ethernet AVB, including generalized Precision Time Protocol gPTP, timestamping, transport protocols and content protection with High-bandwidth Digital Content Protection (HDCP)," the company stated in a press release.

LAN9360 AVB audio endpoint helps to reduce development time, eliminating the need for stack

integration and additional software and firmware development. The solution also supports secure boot and secure remote updates over Ethernet. Unlike other Ethernet bridging networking solutions requiring System-on-Chip (SoC) microcontrollers (MCUs) plus third-party software stacks, the LAN9360 endpoint device requires no software integration, enabling designers to configure the device simply and quickly to manufacturers' unique audio and networking requirements.

Ozonetel to support IIIT-H makes in Telugu speech project

On-demand cloud communication and telephony solutions provider Ozonetel has announced that it has been appointed by Indian Institutes of Information Technology (IIIT-H) – Hyderabad's Centre of Excellence, as a Voice Telephony partner, to crowdsource 2,000 hours of Telugu speech from Telangana and Andhra Pradesh. With this initiative, IIIT-H aims to give users access to personal digital assistants like Alexa, Siri that can use AI enabled speech recognition in Telugu. Post completion of this project, users can converse with their personal digital assistant in Telugu as well along with Hindi and English.

There is a scarcity of voice data sample in the databases for regional languages like Telugu. To address this challenge, IIIT-H has launched this pilot with a set of volunteers. The team will work with academic institutions in Andhra Pradesh and Telangana to collect at least 2,000 hours of spoken content in Telugu in the next one year. The aim is to crowdsource speech from different regions

of the two states to include the diversity of language which is spread across the region.

"As a voice telephony partner, Ozonetel is providing its highly efficient interface KOOKOO platform to collect data from volunteers. Through the KOOKOO platform volunteers can access speech links and record conversation. Ozonetel is helping IIIT-H in building chatbots, voicebots and WhatsApp integration to allow data collection through various channels," the company stated in a press release.

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TRA's Brand Trust Report - India Study 2020
Multitask like an octopus
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As of February 2020, "Most Cores and Threads" in a Ryzen 4000 Series Mobilemobile business processor for ultrathin notebooks than the equivalent Intel vPRO enabled processor. RNP-21

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